

Program Application Library

Disc Object Module Library Maintenance Routine For TDOS DOMLMR

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ABSTRACT

Title: Disc Object Module Library Maintenance Routine (DOMLMR)

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Description: DOMLMR maintains an Object Module Library (OML), on a 70/564 or 70/590 disc unit, in a format acceptable to the RCA Linkage Editor (LNKEDT) utility. DOMLMR will add, delete, and replace individual or groups of modules without the need to replace the entire disc resident library. Because of a difference in format between a disc OML created by the Call Library Transcriber Routine (CLTR) and DOMLMR, this utility will not maintain the master OML. Any attempt to update the master OML with DOMLMR will result in an error message and program termination.

Equipment: Spectra 70 Processor
One tape station
One disc drive
One printer (if PRINT option is used)

Memory Required: Approximately 17,000

Source Language: Spectra Assembly

Timing: The amount of time required to read a tape and transcribe it to disc.

Remarks: A source program deck is available.

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Deletion of modules from the disc OML is accomplished via a console message. The program will request the names of modules to delete when it is run outside of monitor. Up to an 80 character message is accepted from the console which consists of variable length (1 to 8 characters) module names separated by commas. In addition to module names, two special meaning operands may be entered:

\$STOP - If this operand is used, it must be the last entry. This operand specifies no input tape. When it is recognized in the parameter string, the program goes to normal termination.

\$PRINT- This operand causes a listing of the names of all the modules contained in the OML.

When existing modules are deleted from the OML, all the records used by that module are released for subsequent use. For this reason, no file re-organization is required. When a later version of a module is transcribed to the OML, the module is technically deleted from the file and then re-entered as an addition. This allows the size of the module to change without regard for the original area occupied.

DOMLMR will not properly catalog a module containing a sort due to the fact that OMLU does not convert all of the required information contained on SYSUT1. If an attempt is made to convert and catalog a module containing a sort, OMLU will reflect the omitted information in an error listing, produce an OMF and DOMLMR will catalog OMLU's output without warning. Such a cataloged module will not link properly and should be deleted from the disc OML.

Backup for an OML maintained by DOMLMR is provided by the RCA utility Disc Dump and Reload (DDRL). Once a module is cataloged into the OML, there is no way to retrieve it

except via LNKEDT. There is no facility to extract any particular module from the file for subsequent storage on tape or punched cards.

DOMLMR and PREOML contain a constant which reflects the volume serial number of the disc containing the OML. For this reason, no run time parameters are required for proper device assignment. The only program change required is setting these values which are at a tag 'NAME3.'

The user must bear in mind that subsequent software releases may render certain cataloged modules unusable due to changes to the language translators that modify generated coding. The main area of concern is code generated for FCP and by COBOL for the 'CALL' and 'RETURN' verbs. As changes of this type are seldom, they do not pose a serious problem for DOMLMR users.

The storage capacity is:

- 70/590 - 4 records per track -
 1688 bytes per records
- 70/564 - 3 records per track -
 1129 bytes per record

Cylinder one tracks zero thru eight contain the Object Module Directory - one 16 byte entry for each module contained in the library:

- 70/590 - 105 entries per record
 3778 entries maximum (note 1)
- 70/564 - 70 entries per record
 1888 entries maximum (notes 1 and 2)

Cylinder one, track nine, contains the DOMLMR control record.

Cylinder one, tracks eleven thru nineteen, for 70/590 are not used.

Cylinder two thru the last cylinder in the extent contain the data records or actual modules. Each module will require at least two

of these records for storage. The data records are fixed length of 1688 or 1129 bytes to facilitate update writes to the disc; however, the data contained in them is variable length.

Note 1 - Two of the entries in this area are control entries, the first one and the last one.

Note 2 - The 70/564 does not use the last byte of the 1129 byte directory record.

The PREOML and DOMLMR routines are programmed for both 70/590 and 70/564 support. The device used is determined by the assignment made. No program changes are required.

If DOMLMR terminates abnormally, it cannot be run again until the disc extent has been re-established by DDRL. Access is still possible by LNKEDT.

Equipment: One tape station for input (SYSUT2).
One disc drive with the 'Object Module Lib' extent.
One printer if the \$PRINT option is used in reply to the 'MODULES TO DELETE ?' message.

Memory
Required: Approximately 17,000 bytes.

Input Data
Format: The input to DOMLMR is an OML formatted as described in the TOS Utilities Manual 70-35-302. Parameter cards are not required for this program. The names of modules to delete from the disc OML are accepted from the console when the utility is run outside of monitor. The 'Operating Procedures' section of this narrative describes the format and options for the console request.

Output Data

Format:

The output of DOMLMR is described in appendix A of this narrative. Appendix A also correlates the input fields that are used with the output format on disc.

Timing:

The amount of time required to read the tape and transcribe it to disc.

Operating
Procedures
(Initiali-
zation):

1. Allocate disc area for a file named 'OBJECT MODULE LIB'. This area must begin on cylinder one, track zero, and consist of at least two full cylinders. Only full cylinder allocation is acceptable to the DOMLMR system. The extent must consist of contiguous cylinders.
2. Change the volume serial number in the DC entry called 'NAME3' of both the DOMLMR and PREOML programs to reflect the volume serial numbers allocated in Step 1.
3. Assemble and run the PREOML program. The 'STOP CONDITIONS' portion of this narrative explains the typeouts produced. No parameters are required.
4. Assemble and transcribe the DOMLMR program to the master 'PGMLIB' on the executive disc. The system is now ready for use.

(Extent
Change):

From time to time it may be necessary to increase the size of the extent allocated as the OML. This can be accomplished by running RAALLR to de-allocate (not purge) the extent and then to re-establish it. Following the RAALLR run, PREOML must be run to update the control record to reflect the change prior to running DOMLMR. The 'STOP CONDITIONS' portion of this narrative explains the typeouts produced by PREOML. It is recommended that DDRL be run to provide a tape backup for the extent immediately after PREOML has been run.

(General):

DOMLMR may be run as part of a monitor job stream or independently under the TDOS executive. Device assignment is automatic for the required disc device.

INPUT: An Object Module File (OMF) which is SYSUT2 out of the OMLU utility. This assignment is optional - see 'MODULES TO DELETE ?' message.

OUTPUT: Disc resident OMF.
Printer (SYSLST) - optional - See
'MODULES TO DELETE ?' message.

PARAMETERS: No punched card parameters - see
'MODULES TO DELETE ?' message for
console parameter format and options.

MESSAGES FROM PREOML

MESSAGE

EXTENT NOT ALLOCATED IN FULL
CYLINDERS

EXTENT DOES NOT BEGIN AT
CYLINDER 1 HEAD 0

NEW ENDING CYL NO IS = OR <
OLD ENDING CYL NO

RECORD READ WAS NOT CONTROL
RECORD

IS THIS RUN TO CHANGE EXTENTS?
(Y OR N)

PREOML MESSAGES

MEANING

The disc extent established by
RAALLR for use with DOMLMR must
be allocated in increments of
full cylinders. Run RAALLR
again to correct the problem
and retry PREOML.

The disc extent established by
RAALLR for use with DOMLMR must
begin at that location. Run
RAALLR again to correct the
problem and retry PREOML.

The new allocation decreased
the size of the extent rather
than increasing it, or, the
new area was not allocated
contiguous to the old area.

See 'MESSAGES FROM DOMLMR
ROUTINE'

Self-explanatory.

ACTION

None - program terminates.

None - program terminates.

None - program terminates.
Run RAALLR again to
correct the problem and
re-run PREOML.

Response of 'N' causes
the entire object modu-
le library area to be
pre-formatted with dummy
records. Response of 'Y'
causes pre-formatting of
the new area only and
updating of the control
record.

MESSAGES FROM DOMLMR ROUTINE

MESSAGE

MEANING

ACTION

TAPE MOUNTED IS NOT AN OML

Input to DOMLMR must be an OML (output of OMLU).

None - program terminates.
Correct problem and restart the program.

RECORD READ WAS NOT CONTROL RECORD

A control record is maintained in the first cylinder of the 'OBJECT MODULE LIB' extent. A record was read from that area but it is not the control record. Area may not have been pre-formatted by the PREOML routine or an attempt was made to update the master OML with DOMLMR.

None - TERMD

MODULES TO DELETE ?

Program is requesting the name or names of modules to be removed from the OML. This message is typed only if the program is run outside of monitor.

If you do not wish to delete any modules reply 'EOT' else, enter 1 to 8 character module names in any sequence separated by a comma. If you wish to delete modules only and have no input OML, enter \$STOP as the last module name. If you wish to print a listing of all module names contained in the library enter \$PRINT as a module name.
(Continued)

MESSAGE

MODULES TO DELETE ? ...CONT...

MEANING

ACTION

The \$PRINT operand may be used along with module names for deletion and/or with the \$STOP operand. It is recommended that the \$PRINT operand be used as the last operand entered or immediately preceeding the \$STOP operand. Up to 80 characters, including commas, may be entered in reply to this message.

none - program continues

None - program continues

None - program terminates. Reload program and delete module indicated. Delete additional modules if possible or else extend disc file area.

None - program continues.

XXXXXXXXX represents a module name designated to be deleted. The module name was not found in the directory in cylinder 1.

The disc extent must be extended or unused modules must be removed to provide more room.

While searching the record table, the end of the table was reached without locating an open record.

This message will be typed the first time the program is run in a day. If this figure is low, delete unused modules or

MODULE XXXXXXXXXXXX NOT IN LIBRARY

CAUTION ... OVER 95% OF DATA AREA IS USED UP >>>>>>>>

OUT OF ROOM MODULE XXXXXXXXXXXX NOT TRANSCRIBED

NUMBER OF UNUSED DATA RECORDS AT START OF THIS RUN IS XXXXX

DOMLMR MESSAGES

MESSAGE

MEANING

ACTION

NUMBER OF UNUSED DATA RECORDS
AT START OF THIS RUN IS XXXXX
(Continued)

extend the file size upon completion of the run. This message is also typed if programs are to be deleted, in which case the message is for information only.

NUMBER OF UNUSED DATA RECORDS
AT END OF DELETION IS XXXXX

Information only. Message is typed after completion of the delete logic. The difference between this message and the previous message will show the number of records made available as a result of the deletion.

None - program continues.

1-11

EXTENT HAS CHANGED - RUN
PREOML AND RESTART

RAALLR utility was run to change the extent size on disc. PREOML must now be run to update the disc resident control record prior to accessing the file with DOMLMR.

Program terminates -
run PREOML and restart.

FILE NOT CLOSED IN PREVIOUS
RUN - THIS RUN TERMINATED.

Reconstruct disc extent from DDRL backup and restart program.

Program terminates -
No action taken.

MESSAGES FROM DOMLMR AND PREOML

MESSAGES FROM DOMLMR AND PREOML	MEANING	ACTION
DISC I/O ERROR - TYPE R FOR RETRY (Note 1)	I/O to disc has been issued twice without success.	Try at least one more time before giving up.
MOUNT VSN XXXXXX - RUN OLC - TYPE C TO CONTINUE	Required volume, as indicated by XXXXXX is not on line.	Self explanatory.
FOLLOWING FILE NOT FOUND (The line following the message will be the 6 byte volume serial number followed by a 44 byte file name.)	The VTOC of the specified disc was searched and the file was not found. PROGRAMMER: Check the length and contents of the &EMTX operand of the GETEM macro. OPERATOR: May have 2 disc packs on line with same volume serial number.	None - TERMD

Note 1 - This message is also used by the program outside of the macro.

PREOML AND DOMLMR MESSAGES

Programmer Considerations for Use of the Disc Object Module Library

Maintenance Routine (DOMLMR)

The DOMLMR program accepts an Object Module Library (OML) tape as input and transcribes every module on the tape to disc. The output of a program translator (SYSUT1) is an Object Module File (OMF). To convert an OMF to an OML for use with DOMLMR, it is necessary to run the Object Module Library Update (OMLU) routine. The input to OMLU is a SYSUT1 tape, the output is SYSUT2. The following example shows where the OMLU control cards go within a translator job stream. The parameters shown convert all the modules on SYSUT1 to an OML for subsequent transcription to disc by DOMLMR.

Once a module is transcribed to disc, it will remain there until it is deleted via a console message. The program will not request modules for deletion when run under monitor.

When a given module is processed through DOMLMR, the module directory on disc is searched to see if the module already exists. If it does, it is replaced by the new version. If it does not exist, it is added to the file. The only restriction to the use of the DOMLMR is that MODULES CONTAINING A SORT MAY BE TRANSCRIBED TO DISC, BUT THE LINKAGE EDITOR WILL NOT BE ABLE TO LINK THEM BACK. If you do put a sort module out to the library, inform operations so that they may delete it to free up the disc space.

```
// STARTM
// JOB
// PARAM
// translator (ASSMBL, COBOL, FORTRN, RPG)
```

```
        SOURCE DECK (MODA)
```

```
// translator
```

```
        SOURCE DECK (MODB)
```

```
// EXEC OMLU
COPY NONE
CATALO SYSUT1
END
// EXEC DOMLMR
// LNKEDT
PROG MODAB
INCLUDE SYSOML(MODA,MODB)
// ENDMON
```

MODA and MODB will be cataloged as separate modules. If MODA or MODB or both must be re-translated at a later date, the '// EXEC OMLU' thru '// ENDMON' control cards remain the same. For example, if MODB required re-translation, it would be transcribed to disc, following OMLU, and then linked with the original version of MODA.

MAINTENANCE DOCUMENTATION FOR DOMLMR

The logic used to reformat a given record type (00-05) on the input tape OML for the disc resident OML was determined by manual R/A edit comparison after CLTR to a tape edit of the input OML. The reformat logic as determined by this process is explained in appendix A. The same method is quite reliable for determining a problem which may be uncovered in DOMLMR today. As of the time this document is being written, DOMLMR is maintaining over 200 modules on a 70/590 without a problem.

I recommend that prior to any change to DOMLMR, you thoroughly familiarize yourself with this program via the documentation provided. A brief description of each of the sub processing logic modules used is provided along with a detail logic chart. Appendix A and B should also be reviewed prior to going through the main line code of the detail logic charts.

The GETEM macro, which prints out at the front of the assembly listing, is used for random access device assignment to eliminate the need for run time parameters. The function of this macro is to build an extent matrix for the VSN and file name indicated at, in this case, tag NAME3.

The only program change required to implement this utility is the VSN number located at tag NAME3. The program is preset for 70/564 use and modifies itself for 70/590 use if that is the device assigned.

The main line code of the program has notes indicated on the logic chart by double circles which are keyed to the notes themselves. The Sub Processing Notes section is keyed to sections by name and a more explanatory logic chart has been drawn. The Sub Processing Notes are designed for handy reference during your analysis of the main line code to explain the action taken by the 'BAL' blocks.

PREOML PROGRAM NARRATIVE

The PREOML utility is used to preformat the disc extent used with the DOMLMR program. This utility will preformat a 70/590 or 70/564 disc. The GETEM macro is used for device assignment. The volume serial number of the volume to be initialized is at tag NAME 3 card number 02990. The following operations are performed by this program:

1. Verify that the extent starts on cyl 1 track zero and is allocated in full cylinder increments. If the program is being run to extend an existing area, the new ending cylinder number must be greater than the old ending cylinder number.
2. Write 1688 or 1129 byte records of all hex zero to every track in the extent (4 records of 1688 bytes per track for 70/590 or 3 records of 1129 bytes per track for 70/564).
3. The first record of the Directory is formatted as indicated in appendix A. All records in the Directory are chained together by position 1-5. The records in cyl 2 through n are not chained.
4. The control record is constructed and written to track nine cylinder one. The cylinders that are allocated are set to hex zero in the track table of the control record.

The portion of the track table representing area beyond the allocated area is set to hex '77' for 70/564 or hex 'FF' for 70/590 to indicate full.

5. When PREOML is run to extend an existing extent, the newly acquired area is preformatted with dummy records and the control record is updated to reflect the new extent limits.

SUB PROCESSING NOTES

SECTION NAME: MOVE LOGIC

ENTRY POINT: MOVE

FUNCTION: This logic will move the number of bytes specified by the half word constant following the BAL instruction from the address contained in GR 4 to the address contained in GR 5. If the field to be moved is larger than the remaining bytes in the output area (GR 6), the field moved is split to fill up the current output block, that block is written to disc, and the remainder of the field is moved to the start of the next block. After the move is complete, GR 4 and GR 5 are incremented by the number of bytes moved.

SECTION NAME: WRITE LOGIC

ENTRY POINT: WRITE 1
CLEAR
CLEAROT

FUNCTION: This logic will write the block contained in OTARA to disc. It uses the Table To Address (TTOA) logic to determine the 'write to' address on disc. The address (CCHHR) of the next logical record is placed in position 1-5 of the current output record unless the switch at tag OTSW is turned on. When the record is written, GR 6 is set to indicate a full block and GR 5 is set to OTARA+8 in preparation for the next move. The

first disc 'write to' address is generated by the TTOA logic called in the 01 processing for initialization. This routine is entered at tag CLEAR in the house-keeping logic and tag CLEAROT in the 01 logic.

SECTION NAME: CALCULATE NEXT AVAILABLE ENTRY POINT: TTOA
CCHHR FROM TABLE

FUNCTION: This logic generates a CCHHR address for disc based on the next available address in the track table portion of the control record. The generated CCHHR address is placed at tag DCCHH. If the extent is exhausted, it is detected in this logic. The number of remaining data records counter in the control record is decreased by 1.

SECTION NAME: RESET USED BIT IN TABLE ENTRY POINT: ATOT
BASED ON CCHHR ADDRESS

FUNCTION: This logic sets the bit in the track table to off that corresponds to the CCHHR address at tag 'DCCHH'. The number of remaining data records counter in the control record is increased by 1.

SECTION NAME: READ LOGIC FOR RECORD TYPE 00 ENTRY POINT: READ0
READ LOGIC FOR RECORD TYPE 01 ENTRY POINT: READ1

FUNCTION: The disc record specified by CCHHR in tag SEKADR+3 is accessed in OTARA00 for a 00 record or OTARA for a 01

record. The address of the record just accessed (CCHHR) is stored for subsequent use by the REWRITE logic for 00 and 01 records. The CCHHR address in tag SEKADR+3 must be provided prior to entering the READ logic.

SECTION NAME:	USED TO REWRITE UPDATED 00 RECORD	ENTRY POINT:	WRITE0
	USED TO REWRITE UPDATED 01 RECORD	ENTRY POINT:	WRITE01

FUNCTION: The record currently in core at tag OTARA00 for the 00 record or OTARA for 01 record is written to disc at the address stored by a previous read (READ0 or READ1).

SECTION NAME:	LOCATE MODULE NAME IN 00 RECORD	ENTRY POINT:	DL00 DL00D
---------------	------------------------------------	--------------	---------------

FUNCTION: The 8 byte module name at tag DELPRG is located in the directory. If the module name is not in the directory, the address returned points to the next sequential directory entry. The address of the left end of the directory entry in OTARA00 is returned in GR 1. A direct branch to tag DL00D is used in the print logic along with setting the switch at tag 'PONLY' for the serial access of the directory.

SECTION NAME:	LOCATE 01 RECORD BASED ON 00 POINTER	ENTRY POINT:	CHASE01
---------------	---	--------------	---------

FUNCTION: The CCHHR address of the 01 record for the 00 record indicated by GR 1 is accessed into tag OTARA. GR 1 is set to the CCHHR address in the 01 record which points to the first data record for the module. (See appendix A). This module is designed to be used following the DL00 logic.

SECTION NAME: CHASE DATA RECORDS FROM ENTRY POINT: CHASE02
01 TRANSACTION

FUNCTION: Reset the corresponding bit in the track table to OFF for the 01 record just accessed and read and reset all corresponding bits for all 02 through 05 data blocks for the module. The last block for module will contain hex zero in pos 1 through 5.

SECTION NAME: SHIFT 00 RECORD TO DELETE ENTRY POINT: SHIFT00
ENTRY

This logic shifts the 00 record at tag OTARA00 16 positions left to eliminate an entry. GR 1 must point to the left end of the module to be deleted (set up by DL00 logic).

SECTION NAME: MODULE NAME PRINT ROUTINE ENTRY POINT: PRINTO

FUNCTION: This logic prints a listing of all the module names contained in the directory. It is used in the deletion logic as a result of the \$ PRINT operand.

NOTES FOR MAIN PATH LOGIC

<u>Note</u>	<u>Chart Number</u>	<u>HOUSEKEEPING SECTION</u>
1	C-1	The CLEAR logic is located in the WRITE logic section. The OTARAOO and OTARA are cleared to hex zero. The return address from the CLEAR logic is a preset initial value of HSKP+5 at tag ST14 which is loaded into GR14 at the end of the WRITE logic.
2	C-1	This is done to prevent problems in the end of job logic in the event of a null input tape.
3	C-1	All reads and writes to disc will BAL 14 to tag RTRY in the event of an I/O error. This tag is located in the GETEM macro. The GETEM macro maintains a count of the number of re-tries and types a message if the count is exhausted.
4	C-1	The 'R' in the word 'DOMLMR' located in the control record (see appendix B) is used for a file lock/unlock indicator. If the program terminates abnormally, the file will be locked. This prevents DOMLMR from changing data in the file until the maintenance programmer can analyze the problem. The indicator is reset by re-establishing the file with DDRL.
5	C-1	Control record verification is made by a compare of the constant 'DOMLMR' to the first six positions of the control record read. See appendix B for the format of the control record.
6	C-1	If the ending CCHH in the extent matrix does not match the CCHH in the control record, the program terminates. Probably caused by the size of the extent being extended by RAALR and not running PREOML to update the control record and preformat the new area prior to running DOMLMR.
7	C-1	The 'R' in the word 'DOMLMR' is reset at this point. When the control record is written back to disc at normal end of job, it will unlock the file.

- 8 C-2 The date in the executive is compared to the date in the first record in the Directory. See Directory Record format in appendix A.
- 9 C-2 Because the module names entered via the console can be variable length, they must be expanded to eight positions prior to searching for them in the Directory.
- 10 C-3 The comparison of tag DELPRG to the address in GR 1 indicates if the module was found in the directory or not. (See DLØØ logic.)
- 11 C-3 The letters 'CCHHR' are placed in the Directory record in place of an actual disc address until the '01' (Index Record) is read from the input tape and on actual disc address is calculated for the 01. This compare was mainly used for debugging.
- 12 C-3 Setting DELPRG to hex zero causes the DLØØ logic to access the first directory block and point to the first directory record following the dummy record (see appendix A).
- 13 C-3 Setting the NOP switch in the DLØØ logic causes serial access of every record of every block in the directory.
- 14 C-3 PRINTO, the logic module that formats and prints the directory listing, uses logical level FCP. For this reason, the address generated by the DLØØ logic in GR 1 must be shifted to GR 5 to be saved.
- 15 C-3 The high dummy Directory entry (see appendix A) signals end of job to the print logic module (PRINTO) and breaks the print loop.
- 16 C-3 Tag DLØØD is located in the DLØØ logic module. Because the DLØØ logic was last entered by a BAL 14 (just prior to tag PLISTB) it will continue to return to that tag until it is reset by a BAL 14 from another location.

- 17 C-4 The DTFSR for the input tape is set for unlabeled tape. The 3 EXCPW macros rewind the tape and position it in front of the first tape mark for the open macro. The DTFSR is also set for no rewind at open.
- 18 C-4 The first data record following the tape mark on a tape OML is a special identifying record.
- Note Chart OBJECT MODULE DIRECTORY BLOCK (00) PROCESSING
 Number
- 19 C-6 General registers 5, 6 and 7 are loaded from tag REC00. GR 5 contains the starting address of OTARA00+8 in the REC00 area. This value is used as the 'TO' address in the MOVE logic. After a move, GR 5 is incremented by the length of the move to set up for the next move. GR 6 contains the number of bytes that will fit in the current record. This register is decremented by the number of bytes moved. GR 7 points to tag REC00. This is used to access reset values for the first two entries (GR 5 and 6) and to access the storage area for the CCHHR of the 00 record currently in core. (See READ0 and WRITE0 logic.)
- 20 C-6 The MOVE logic will automatically write a record when the I/O area is full as determined by the remaining byte count in GR 6. This logic is not desirable for the 00 record processing. By loading GR 6 with the value of 2000, this feature is not used.
- 21 C-6 The NOP at tag MEX0 is set to go to tag EM0.
- 22 C-6 The 00 record contains multiple module names and is fixed length. The unused portion of the tape record following the last module name is filled with hex zero. In the event that the 00 record is full, GR 10 is loaded with the address of the last input record position plus 1. As GR 4 is moved from one module to the next, it is compared to GR 10 for equality.
- 23 C-6 This switch is turned on at 'A' page 7 when a new module is to be added to the file. When the switch is 'on', the 00 record is rewritten to disc.

- 24 C-6 This switch is turned on when an entry was shifted out of the block to make room for an addition. (See tag OF000 page 7.)
- 25 C-6 Go read the 01 record in the data position of the extent into OTARA.
- 26 C-6 Go access all records for the module in the data position of the file and set the bits in the track table to not used.
- 27 C-7 This block saves the current address of the module being processed in the tape input area. It then sets the 'TO' address for the move logic (GR 5) to the end of the OTARA00 area +1 and the 'FROM' address for the move logic to the last 16 byte entry in in the OTAR00 (70th entry for 564, or 105th entry for 590).
- The BAL to 'MOVE' at tag MAGN moves 16 bytes and increments GR 4 and GR 5 the length of the move.
- 28 C-7 The switch at MEX0 is turned on when the last move is about to be made. The normal ON for this switch goes to tag EMO. The switch is altered to go to tag OF000B at tag ONFR on page 8. This setting is used if more than one directory block has to be accessed and shifted to make room for a module entry.
- 29 C-7 GR 1 contains the address in the OTARA00 block of where the new module should be merged. A compare of GR 4 (from address of move) to GR 1 for equality determines the last module is about to be moved and sets the switch at MEX0 to break the loop. If GR 4 value is less than GR 1, the error branch tag TERMDA is taken.
- 30 C-7 If the error condition at note 29 is sensed, it is not an error if the module to be added belongs in the last position of the record.
- 31 C-7 Record shifted out is determined by a compare of hex zero to the end of OTARA00+1. If the area

contains hex zero, no record has been shifted out. If a record has been shifted out, it is put in the first entry of the next 00 block.

32 C-8

GR 1 is set to the address of OTARA00+8. This causes the logic at tag SHIFT00 to move every entry in the 00 record 16 bytes right to free up the first entry for the entry shifted out the end of the previous record.

Note Chart
Number

INDEX BLOCK (01) PROCESSING

- 33 C-9 If multiple 01 blocks are read for a single module, they all contain the same indicators for the number of entries, externs and common as well as the same constant info. For that reason, this branch goes directly to the logic to move the 'N' fields contained in the second and following records. (See appendix A-4)
- 34 C-9 This is the first call in the program for an address generation from the table. The TTOA logic generates the CCHHR of the first available disc address at tag DCCHH. The WRITE logic keeps track of the next available disc address to put in bytes 1 thru 5 of the current record by issuing all subsequent calls for logic module TTOA.
- 35 C-9 The area OTARA is cleared to hex zero initially at this point. The WRITE logic clears this area after each WRITE.

Note Chart
Number

INDEX BLOCK 01 PROCESSING

- 36 C-10 The 'move' logic will write the 01 record to disc if the output area is full. In this case pos 1-5 of the first 01 record will contain the CCHHR of the next 01 record.
- 37 C-10 See the Utilities Manual for definition of SUB CODE in position 2 of the input tape for a 01 type record.
- 38 C-10 Since 01 records are written under control of the WRITE logic used with the MOVE logic, the CCHHR of the next record is placed in pos 1-5 of the record. Control is transferred to this block when the last 01 record for the module has been constructed. Since this is the last data record for this module until the 02 record is later accessed from tape, it is so indicated by the hex zero in pos 1-5. Setting the switch in the WRITE logic inhibits the moves of CCHHR to overlay the hex zero.

Note Chart
Number

OBJECT MODULE DESCRIPTOR BLOCK (02)

39 c-11

The 02 records on tape represent the first record of a new module. The first 02 accessed will follow the last 01 record on tape and will cause the switch at tag D02 to be turned off. When the switch is off and an 02 record is read from tape, the last record for the previous module is written to disc with positions 1-5 of that record set to hex zero as an end of module indicator. The number of used bytes in the record is also calculated and put into the record.

Note Chart
Number

EXTRN BLOCK PROCESSING (03)

40 c-12

This move takes all the extrns in one move to the output record. GR 4 and 5 are set to the correct addresses by the previous move. The number of bytes to move is calculated in the logic at tag D03B.

Note Chart
Number

TEXT BLOCK (04) AND MODIFIER BLOCK (05) PROCESSING

41 c-13

When the address of tag LENO4 is sent to the move logic in Gr 4, the move logic will check to insure that there is at least 10 bytes remaining in the output area prior to the move. If less than 10 bytes remain, the current record is written to disc and the data in tag LENO4 is put at the front of the next record. This is done to insure that fields A thru D are not split over two records.

Note Chart
Number

END OF JOB PROCESSING

42 c-14

Since the WRITE logic maintains the CCHHR of the next available disc address, it must be reset to unused at end of job. The table entry was initially set to used when the CCHHR was generated in the ATOT logic.

APPENDIX A

Input Record To Output Record Conversion

See TOS Utilities Manual 70-35-302 (Object Module Library) for a description of the input tape.

To illustrate the conversion from tape Object Module Library (OML) format to disc OML format, charts have been interspersed with the narrative. The space between each dot represents two bytes. The tape and disc positions indicated are zero relative. A field with no tape position indicated in the 'From Tape' line indicates information generated by the program. A layout with no 'To Disc' line indicates that the particular record type can be located anywhere within the data bytes allotted in each disc record. The first 8 positions reflect the five position CCHHR address of the next logical record for the module, followed by a three position hexadecimal count field of the number of data bytes that are used.

The basic processing is as follows:

Record type (00)₁₆ (Descriptor Block) - fixed length of 16 bytes on disc.

Each 16 byte entry is merged into a sequential location in one of the records located in cylinder 1 track 0 thru 8.

Record type (01)₁₆ (Index Block) - starts a new record in the data portion of the file (note 1).

Record type (02)₁₆ (Descriptor Block) - starts a new record in the data portion of the file (note 1) and is immediately followed on the output record by the next input transaction (03)₁₆, (04)₁₆ or (05)₁₆.

Note 1: The data portion of the file is cylinder two track zero to end of extent for 70/590 and 70/564. This is the area covered by the track table contained in the DOMLMR control record. Cylinder one tracks zero thru eight contains the Object Module Directory, cylinder one track nine is the DOMLMR control record. Cylinder one tracks eleven thru twenty are not used on the 70/590.

Record

Size: 70/590 is 1688 byte records - 4 per track - 1680 data portion.
70/564 is 1129 byte records - 3 per track - 1121 data portion.

Object Module Directory Block (00)₁₆

Disc Record Layout

	A	B	C	D	E
From TAPE			9 1 6		
To DISC	0 4 5 7 8		1 1 5 6	2 2 2 0 1 3	
Size	5	3	8	5	3

Field Contents

- A. CCHHR of next Object Module Directory Block (next sequential record in cylinder one).
- B. Three position byte count for this block - represents the sum of the 16 byte entries only. This field is calculated in the Object Module Directory Block Logic (00)₁₆.

Fixed length entries of 16 bytes - one per module.

- C. Eight position module name.
- D. CCHHR of the corresponding Index Block in the data portion of the field. (established when the Index Block - (01)₁₆ is read from tape.)
- E. Three position displacement of the Index Block within the record specified in field 'D'. (zero in all cases because each Index Block starts a new record)

General:

1. The total record length is 1129 bytes (16 byte entries X 70 entries per record) + 8 control characters + 1 unused byte at the end of the record) for 70/564. For the 70/590 the total record length is 1688 bytes (16 byte entries X 105 entries per record) + 8 control characters.
2. DOMLMR uses tracks 0 thru 8 of cylinder 1 to contain the Object Module Directory.

3. Entries do not overflow records.
4. The first entry of the first record contains - 'OMLU 22 10 YYJJJ' where YYJJJ is the year and julian date of the last reference to the file by DOMLMR.
5. The last entry of the Directory contains a module name of lozenges, a CCHHR of 'CCHHR' and a displacement of hex zero except for 2⁷ of the high order position.

Index Block (01)16
Disc Record Layout

	A	B	C	D	E	F	G	H	I	J	K	
From TAPE				1 1	1 8			2 5	2 4 7 7	5 5 4 5	3 5 8 9	4 6
To DISC	0	4 5	7 8 9	1 0	1 7 8	2 2 3	2 6 7	2 2 9	3 7 9 0	3 7 8	4 1 2	4 9
Size	5	3	2	8	5	3	1	3	8	4	8	

	L	M	N										
From TAPE	3	5	5	5	7	7							2
To	1	3	8	7	8	9	0	1					9
DISC	5	5	5	6	7	7							8
Size	0	7	8	9	1	2							
	8	2	12										

Index Block (01)₁₆
Disc Record Layout

Field Contents

- A. CCHHR of first detail record for this module. Same as field 'E'. Established when the (02)₁₆ record is read from tape.
- B. Byte count for this block - represents size of data portion only.
- C. Byte count for the record.
- D. Module name.
- E. CCHHR of first detail record for this module. (Same as field 'A') Established when (02)₁₆ record is read from tape.
- F. Displacement of data in the record located at the CCHHR address indicated in field 'E'. (zero in all cases because each Object Module descriptor Block (02)₁₆ starts a new record).
- G. Unused - pad with zero.
- H. Module length.
- I. Extern name.
- J. Starting address.
- K. DDNAME (for include)
- L. OMNAME (for include)
- M. Unused - set to zero.
- N. First 12 byte entry name (8 bytes) and starting address (4 bytes). This field is repeated for each entry, extern and/or common for this module.

General:

- 1. Each Index Block begins a new record.

2. The Index Block is variable length as determined by number of entries, externs and common. (total entries, externs, and common X 12 Bytes per entry + 50).
3. The address of the Index Block record is determined by the table search logic in the TTOA logic.

Object Module Descriptor Block (02)₁₆
Disc Record Layout

	A			B			C			D	E	E ₁	F			G		
From TAPE										0	1	2	2	2	6			1
													0	2				3
To DISC	0		4	5	7	8	9	1	1	1	1	1	1	1	1			2
								0	1	2	3	5	6					3
Size	5			3			2			1	1	1	3			8		

Field Contents

- A. CCHHR of next record for this module or hex zero if this is the last record for the module.
- B. Block length - initially set to the maximum data bytes to reflect a full record in the (02)₁₆ processing. Reset to adjusted length when the next (02)₁₆ is read or the end of the input tape is read in the End of Job Logic.
- C. Record length - '000E' for (02)₁₆ record.
- D. Block Code (02)₁₆
- E. Type of block that follows (See Utilities Manual for code explanation.)
- E₁. Hex zero - reserved for future use.
- F. Load address for first text block.
- G. Module name.

General:

1. Each Object module Description Block begins on a new record. It will be immediately followed by one of the other record types (03₁₆-05₁₆).
2. The CCHHR address of this record is contained in the corresponding Index Block (01)₁₆ fields A and E.

EXTRN Block (03)₁₆

Disc Record Layout

	A	B	C	D	E	F	G
From TAPE		0	1	8	1	1	2
				1	2	9	0
To DISC							
Size	2	1	1	4	8	1	2

Field Contents

- A. Length of (03)₁₆ record - starting in tape relative position 12 is a variable number of 11 byte EXTRNS. This length is computed in the 03 logic by multiplying the number of these 11 byte entries by 11 and adding 6 additional bytes for the fixed length portion of the disc record.
- B. Block Code - (03)₁₆
- C. Block Subcode (See Utility Manual for code explanation)
- D. Filler - not used.
- E. EXTRN
- F. Type Code
- G. ESID

General

1. Fields E, F and G represent one EXTRN. These fields are repeated for each EXTRN.
2. The EXTRN block may be located anywhere in the data portion of a disc record and may overflow records.

Text Block (04)₁₆

Disc Record Layout

	A	B	C	D	E
From TAPE		0	1	4	7 2 0.....N
To DISC					
Size	2	1	1	4	up to 1044

Field Contents

- Length of (04)₁₆ record - this size is calculated by adding 6 bytes to the 'Block Byte Count' field positions 2 and 3 of the (04)₁₆ record.
- Block code (04)₁₆
- Block Subcode (See Utilities Manual for code explanation.)
- Load address of next block.
- Text - variable size - up to 1044 bytes.

General

- The move logic will insure that fields A, B and C will fit on the end of the current output record when field 'A' is moved. To accomplish this the current output record must have 10 or more bytes remaining prior to the 'A' field move. If it does not have sufficient room, the length of the current output record (OTARA + 6 and 7) is modified, the record is written to disc and the 'A' field is placed in the next record starting in OTARA + 8.
- The 04 record may reside anywhere in the data portion of a disc record and may overflow records.

Modifier Block (05)₁₆

Disc Record Layout

	A	B	C	D	E
From TAPE		0 1	4 7	2 3	1 2.....N
To DISC					
Size	2	1 1	4	2	up to 117 char.

Field Contents

- A. Length of (05)₁₆ record - this size is calculated by subtracting 4 from the length of the tape record read.
- B. Block Code (05)₁₆
- C. Block Subcode (See Utilities Manual for code explanation.)
- D. Load address of next block.
- E. Modifier count.
- F. Modifiers - 10 bytes each. The length of this variable portion of the record is calculated by subtracting 12 from the length of the input record. (See Utilities Manual for contents of modifier record.)

General

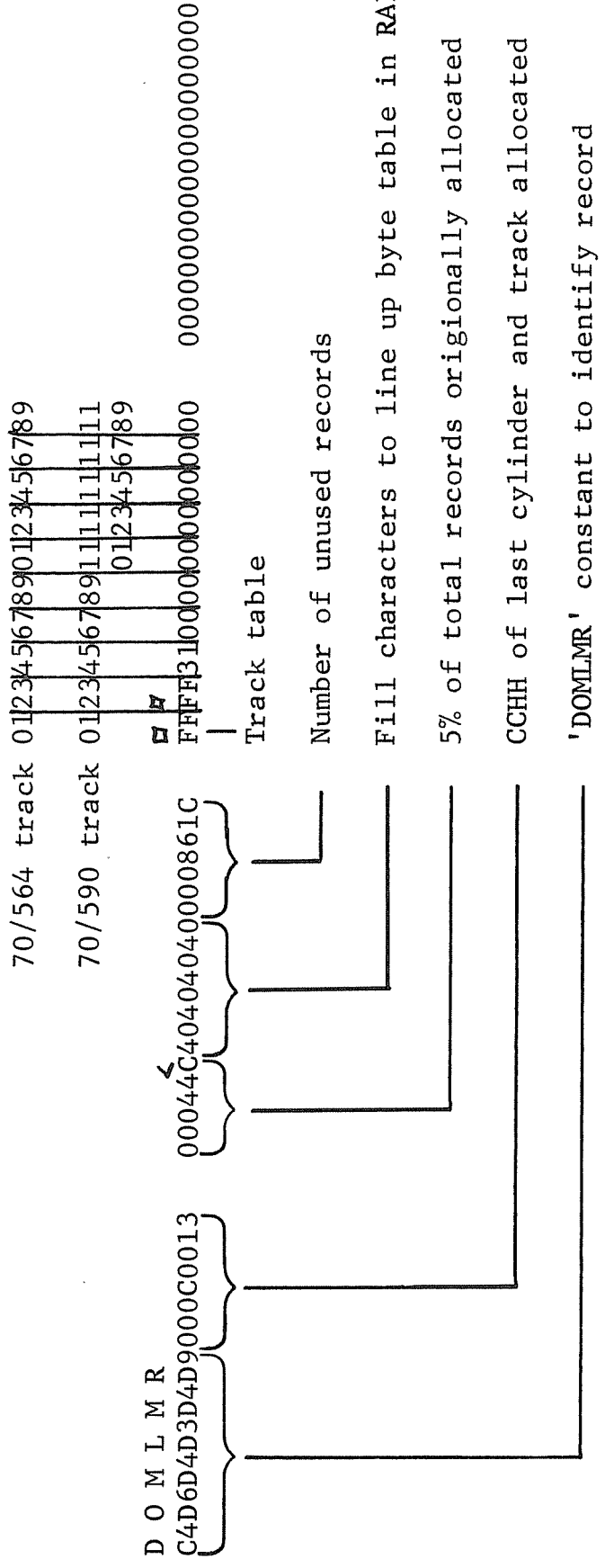
1. The 05 record may reside anywhere in the data portion of disc record and may overflow records.
2. Fields A thru E may not be split; the balance of the input record may be.

APPENDIX B
CONTROL RECORD FORMAT

THIS RECORD IS CONTAINED ON CYLINDER 1, TRACK 9, RECORD 1

<u>FIELD</u>	<u>POSITION</u>	<u>SIZE</u>	<u>DESCRIPTION</u>
1	0-5	6	RECORD IDENTIFIER (DOMLMR)
2	6-9	4	CCHH OF LAST TRACK IN EXTENT
3	10-12	3	5% OF ORIGINAL NUMBER OF RECORDS AVAILABLE. PROGRAM WILL TYPE WARNING MESSAGE WHEN FIELD 5 BECOMES EQUAL TO OR LESS THAN THIS AMOUNT. (PACKED)
4	13-16	4	NOT USED - FOR RAEDIT ALIGNMENT ONLY.
5	17-19	3	NUMBER OF UNUSED RECORDS IN DATA PORTION OF FILE (PACKED).
6	20-2019	2000	ONE BYTE REPRESENTS 2 TRACKS. THE TOP HALF OF THE TYPE (2^4-2^6) REPRESENTS RECORDS 1 THRU 3 (RELATIVE) FOR THE ODD NUMBERED TRACKS. THE BOTTOM HALF OF THE BYTE (2^0-2^2) REPRESENTS RECORDS 1 THRU 3 (RELATIVE) FOR THE EVEN NUMBERED TRACKS. BITS 2^3 AND 2^7 REPRESENT RECORD 4 FOR THE 70/590. A 1 BIT INDICATES RECORD IN USE, A 0 BIT INDICATES RECORD NOT IN USE.

The following example illustrates the DOMLMR control record.



Track Table;

The 'FFFF' in the first two positions indicates that records 1 thru 4 of tracks 0 thru 3 of cylinder 2 are used for a 70/590. The same indication for a 70/564 would be '7777' because only records 1 thru 3 are used.

The '31' indicates:

- | | | | |
|--------|----------------------------------|---------|--|
| 27 = 0 | -record 4 not used (70/590 only) | Track 4 | Starting with the table location corresponding to the ending CCHH+1 thru table position 2000 all locations are set to 'FF' for 70/590 or to '77' for 70/564 by PREOML. This is to prevent generating an address beyond the allocated area. |
| 26 = 0 | -record 3 not used | | |
| 25 = 1 | -record 2 used | | |
| 24 = 1 | -record 1 used | | |
| | | | |
| 23 = 0 | -record 4 not used (70/590 only) | Track 5 | Each decade of the track table represents 1 cylinder for the 70/590. Each half decade represents a cylinder for the 70/564. The table starts at cylinder 2. |
| 22 = 0 | -record 3 not used | | |
| 21 = 0 | -record 2 not used | | |
| 20 = 1 | -record 1 used | | |

The following example illustrates the use of the DOMLR control record for disc address generation.

A partial RAEDIT of a DOMLMR control record:

DOMLMR

C4D6D4D3D4D9000C0013 0004C40404040000861C

Sample core locations

Address generation is accomplished in the Table to Address (TTOA) logic in DOMLMR as follows:

102 address of the first table position
that does not contain 'FF' or '77'.
-100 subtract starting address of table.

$$-\frac{100}{2}$$

$$+\frac{1}{3} \text{ add 1.}$$

$\frac{3}{6}$ double the result.

+ (1) this value is -1 if the unused bit is located in 2⁴ thru 2⁷ else zero.

5

$$-\frac{1}{4} \text{ subtract 1.} \\ \equiv \text{ track num}$$

4 = track number - if over 10 or 20, divide by 10 or 20 for cylinder number, in which case, the remainder will be the track number. The result is added to the base address of C2, H0 to arrive at the actual address.

Reset unused bit in table based on CCHRR address. This is accomplished in the Address To Table (ATOT) logic in DOMLMR.

CCHHR

Example: 0002000403

2 subtract starting cylinder no.
0000

X 20 multiply by tracks per cylinder
(10 for 70/564 or 20 for 70/590)

0000

+ 0004 add the head number.

2) 0004 divide by 2 tracks per byte in
0002 table

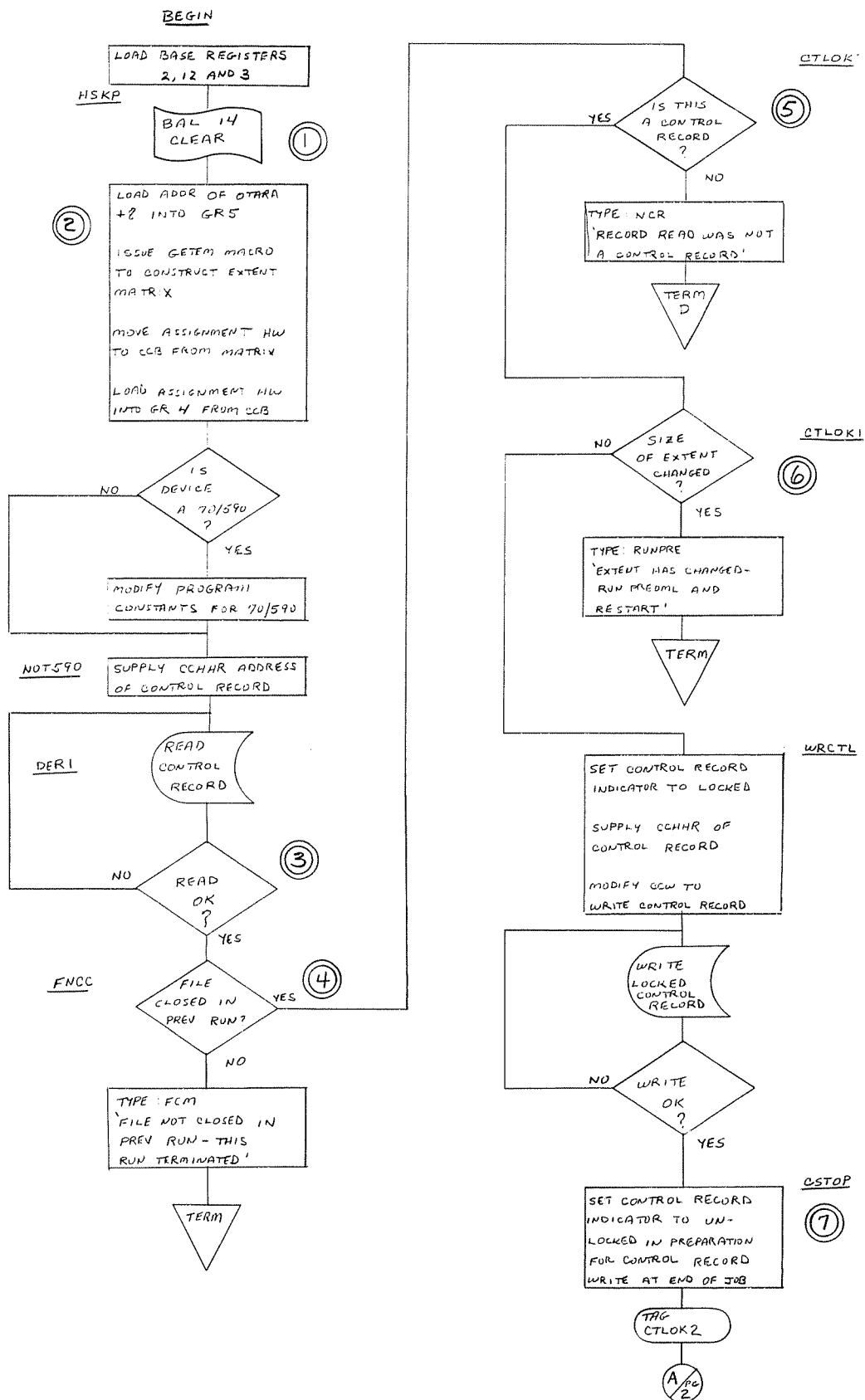
$$+ \frac{100 \text{ add starting address of table}}{102 \text{ -effective table address.}}$$



NOTE Next available Record is determined by a test under mask (TM) starting with 2⁴- 2⁷, then 2⁰- 2³. Once an open bit is detected, it is turned on by an OI instruction to indicate used. See TTOA logic.

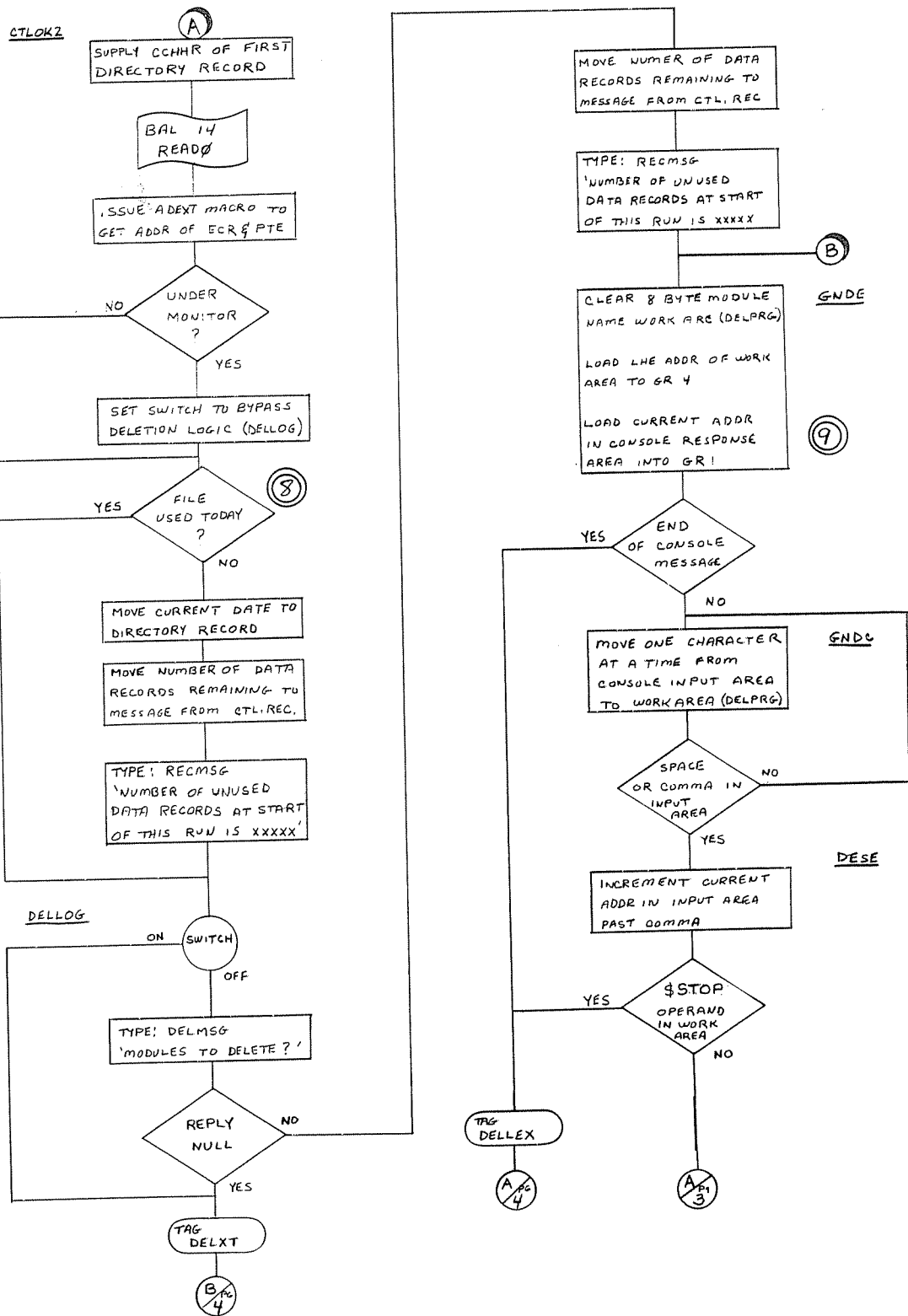
An XC instruction is used in ATOT to reset used bits to zero.



APPENDIX C

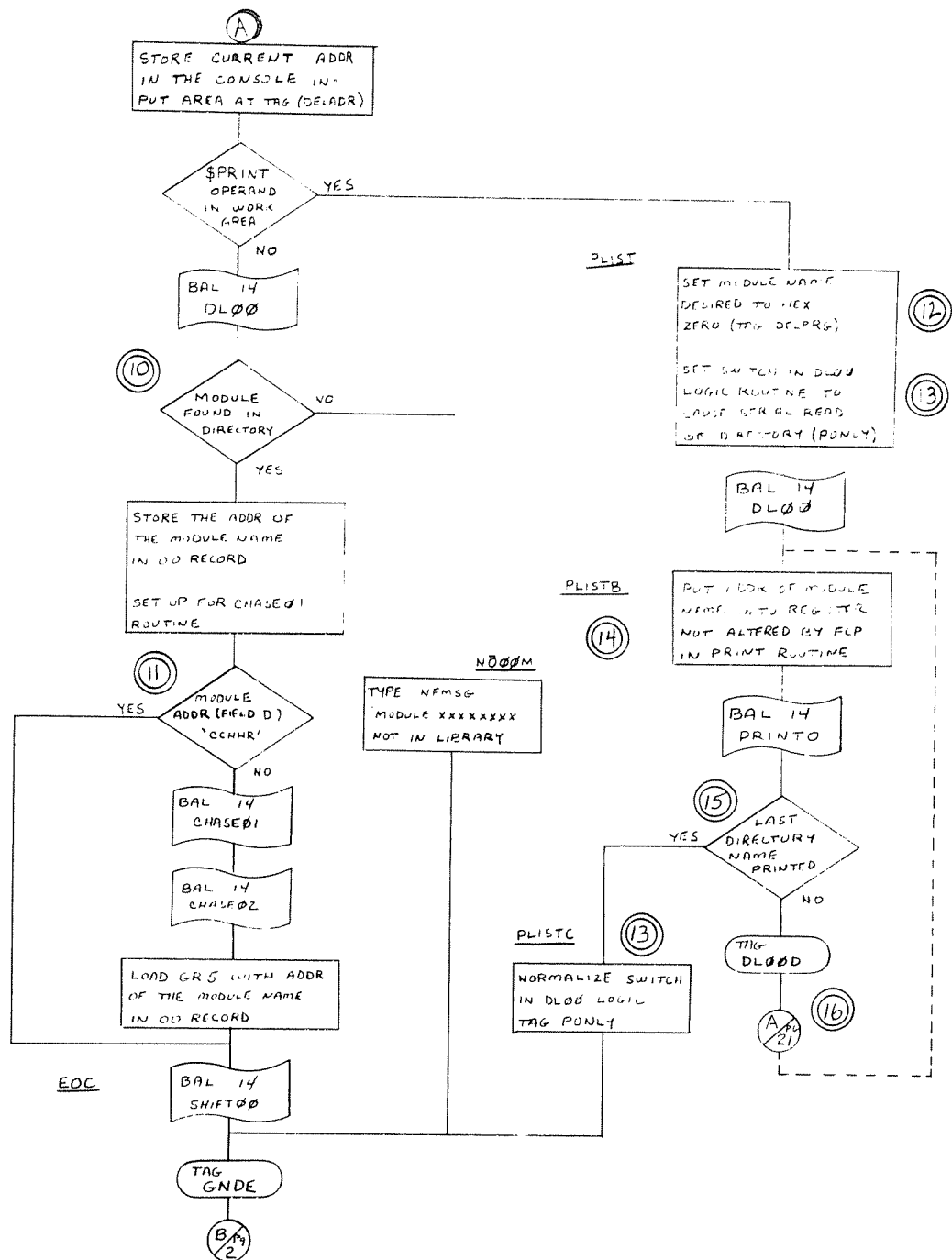
DOMLMR LOGIC FLOWCHARTS



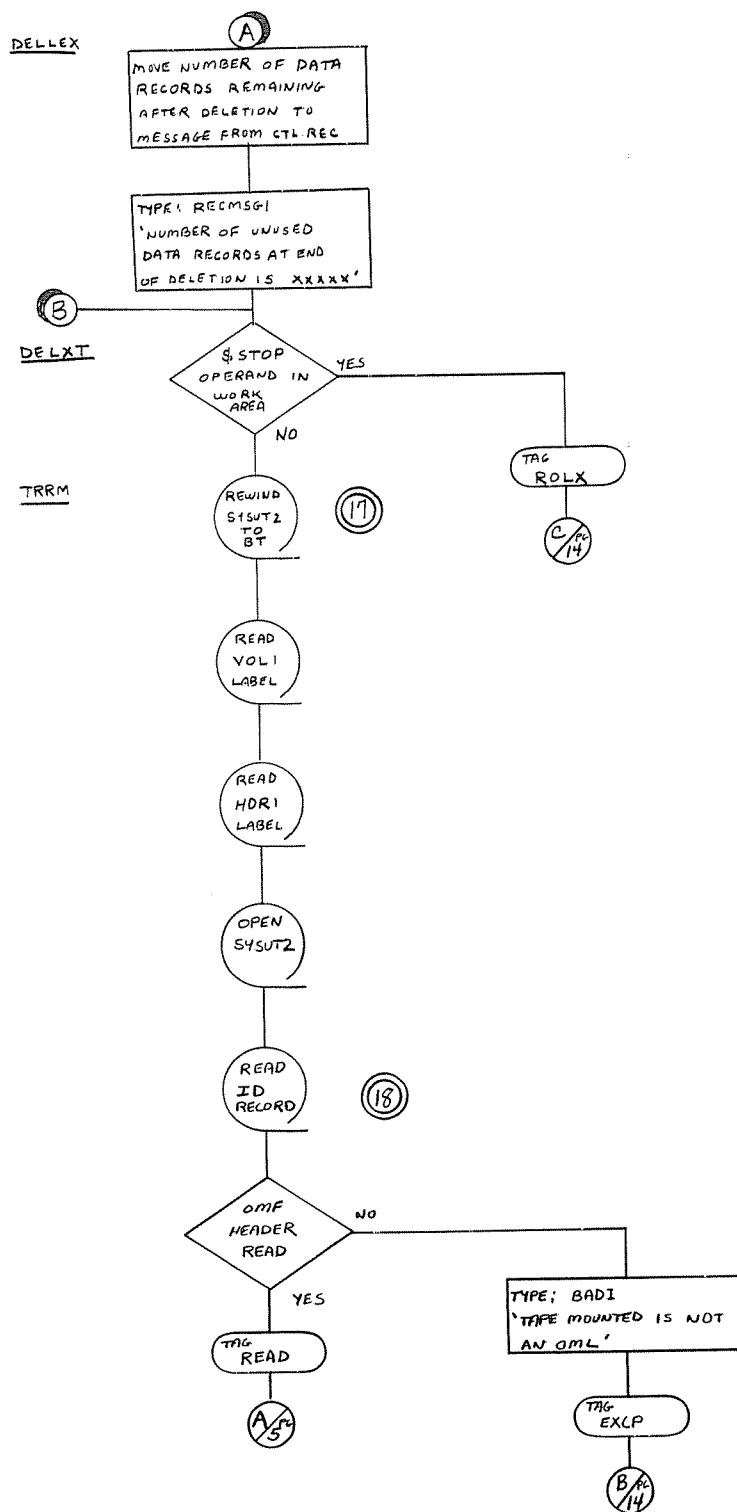
 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	 Chart Title HOUSEKEEPING LOGIC	Date	Chart No. 1 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title ACCESS AND VERIFY CONTROL RECORD	Revision Letter	Date




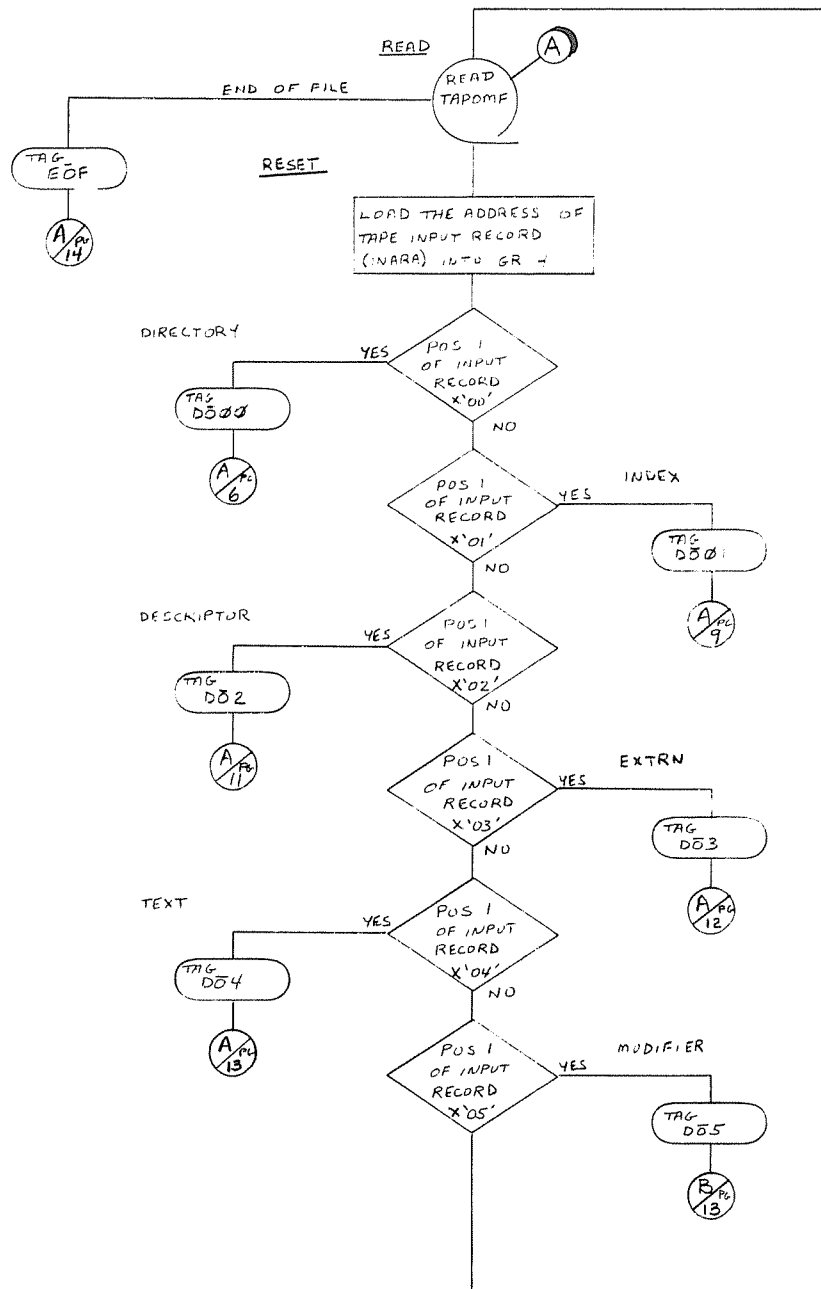
 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING		Chart Title	Date	Chart No.
		HOUSEKEEPING LOGIC		2 of 24
System Title		Program Title	Revision	
DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)		DELETION LOGIC	Letter	Date




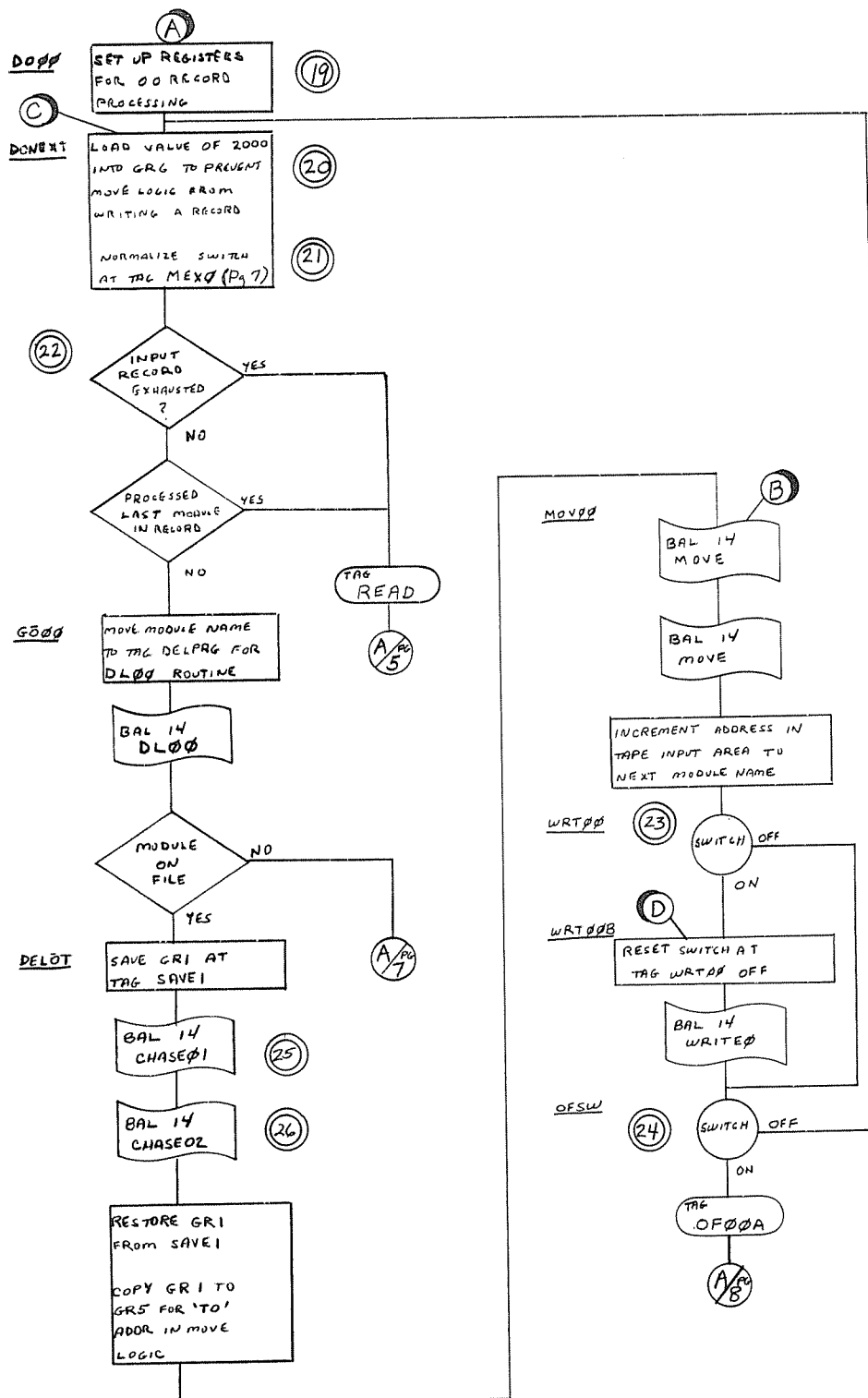
	RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING		Chart Title HOUSEKEEPING LOGIC	Date	Chart No. 3 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DUMMR)			Program Title DELETION LOGIC	Letter	Revision Date




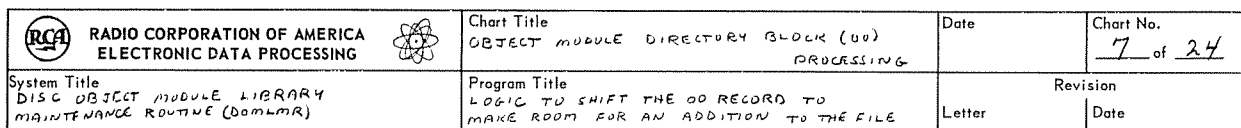
 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title HOUSEKEEPING LOGIC Program Title DELETION LOGIC EXIT & INPUT TAPE VERIFICATION	Date Letter	Chart No. 4 of 24 Revision Date
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DUMLMR)			

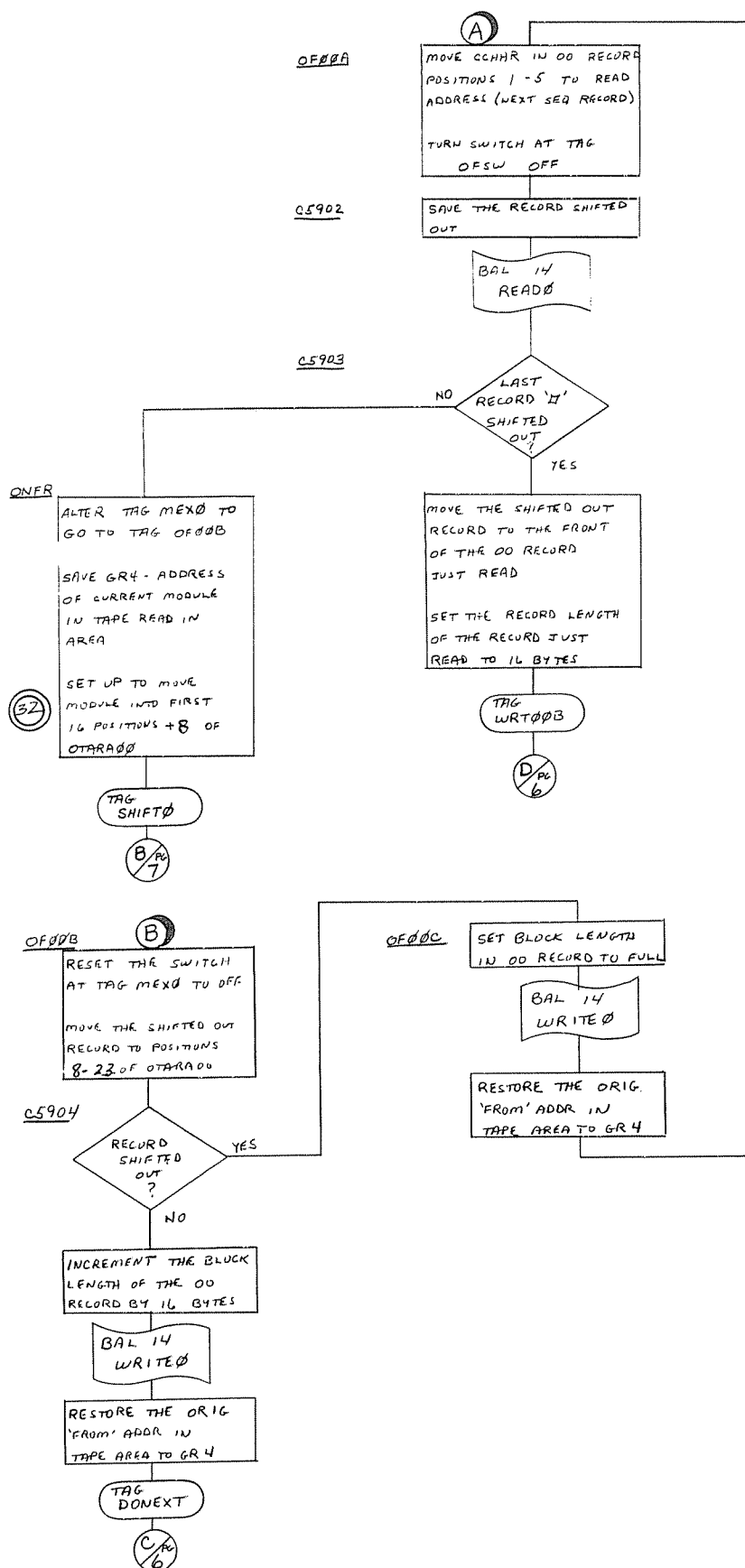



 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title TAPE READ AND INPUT RECORD TYPE DETERMINATION LOGIC	Date	Chart No. 5 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title	Letter	Revision Date

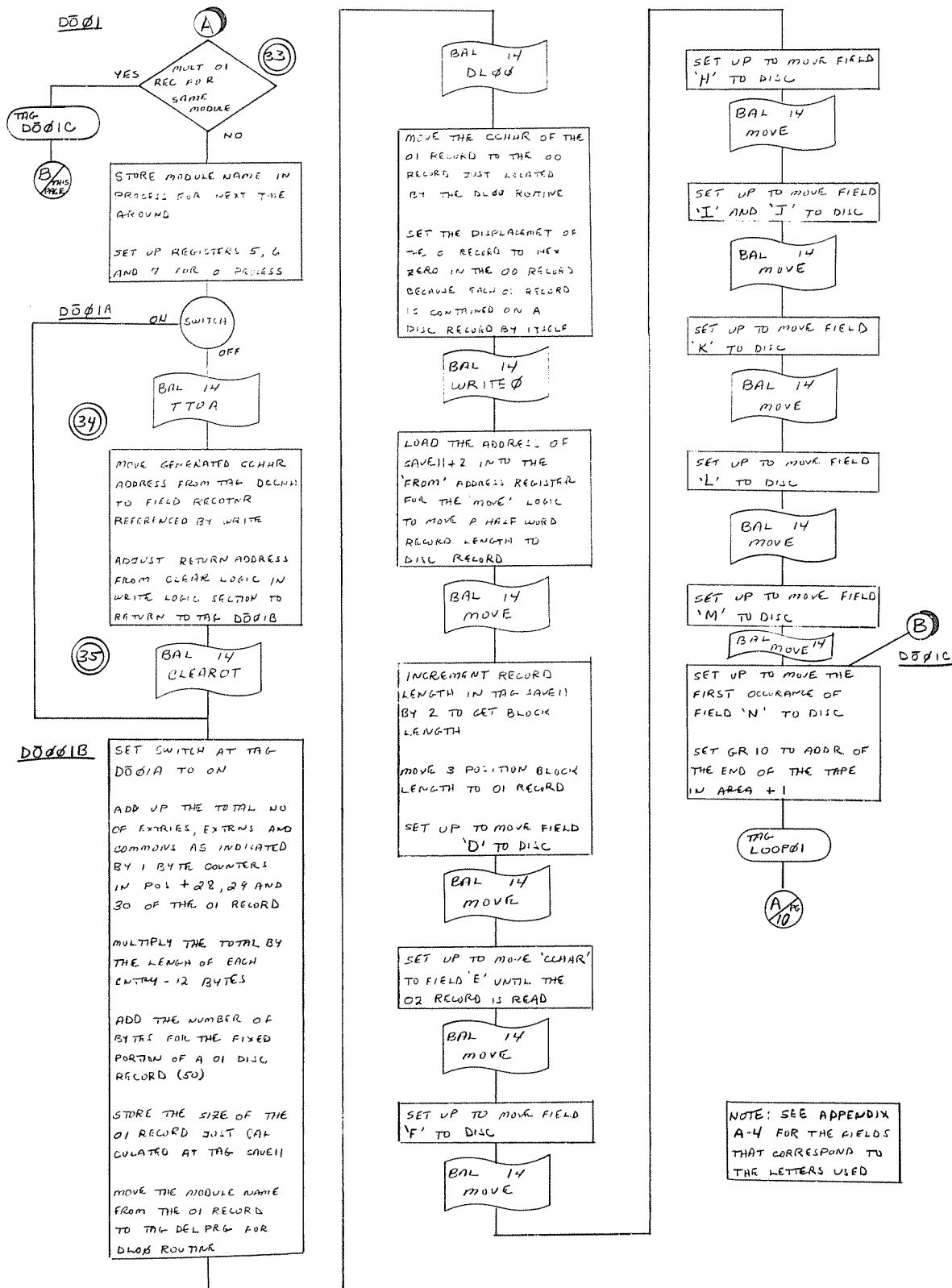



 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title OBJECT MODULE DIRECTORY BLOCK (OV) PROCESSING	Date	Chart No. 6 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DUMLMR)	Program Title MAIN LINE CODE	Letter	Revision Date

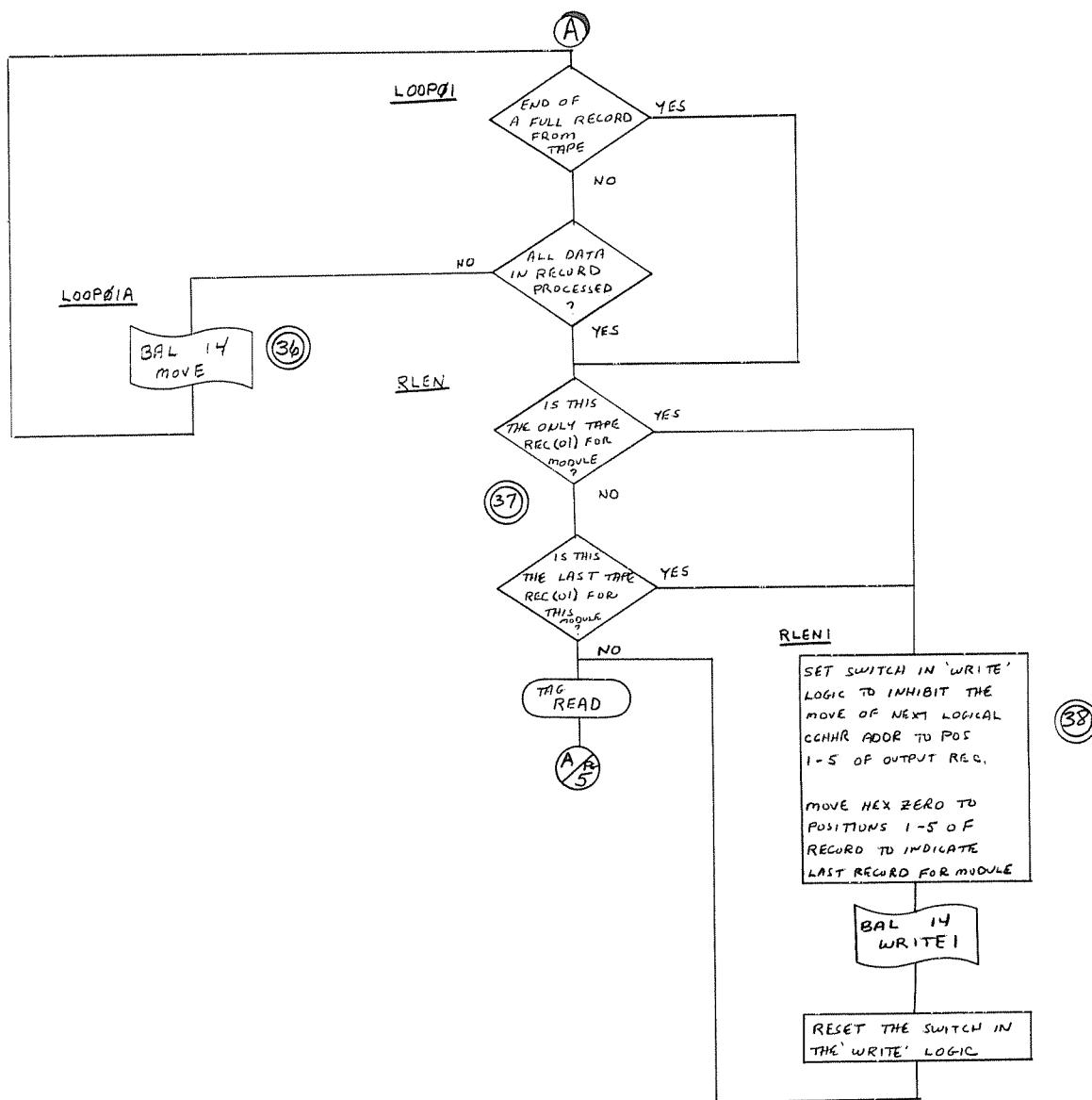




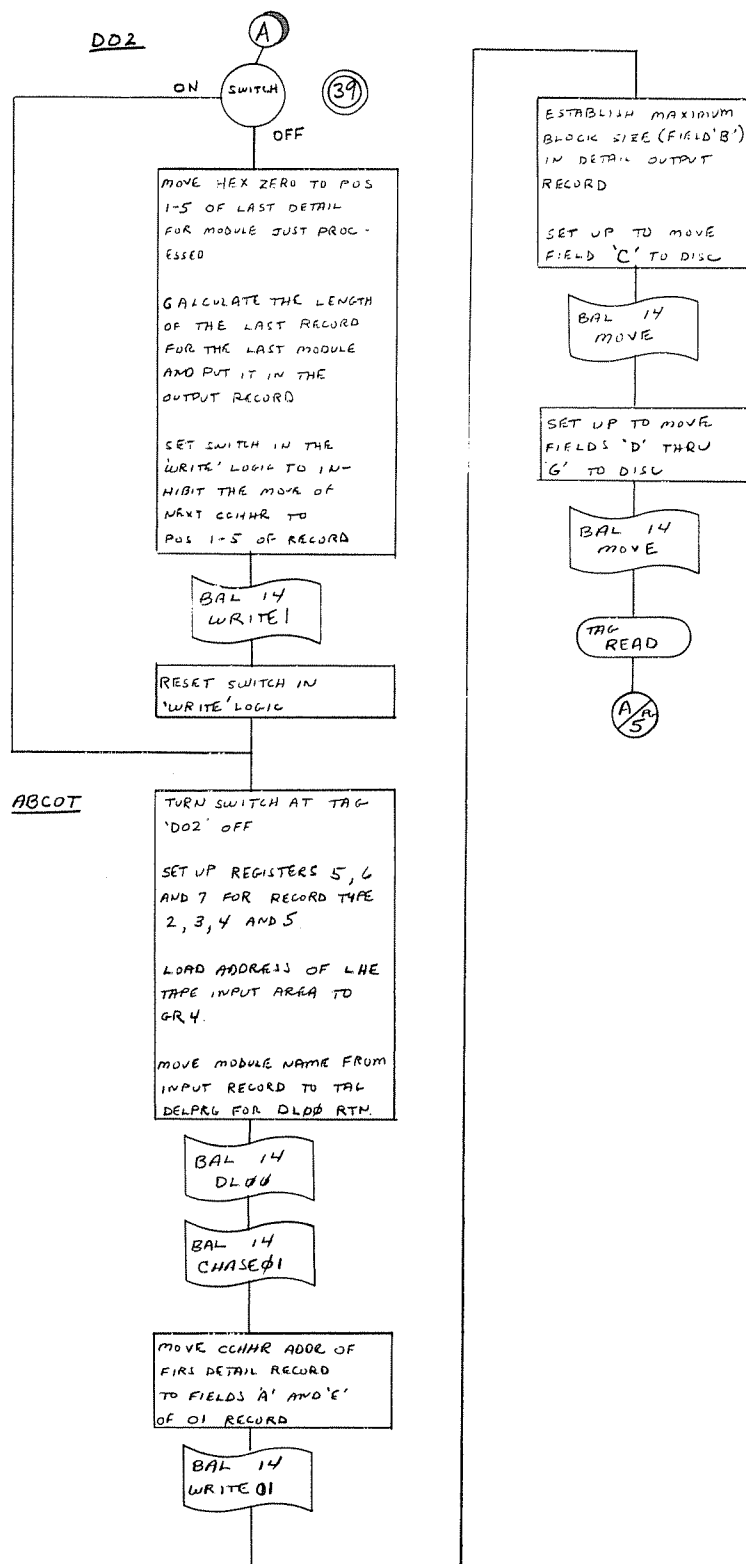
 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title OBJECT MODULE DIRECTORY BLOCK (00) PROCESSING	Date	Chart No. 8 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title LOGIC TO PROCESS TRUNCATED RECORDS AS A RESULT OF A SHIFT	Letter	Revision Date





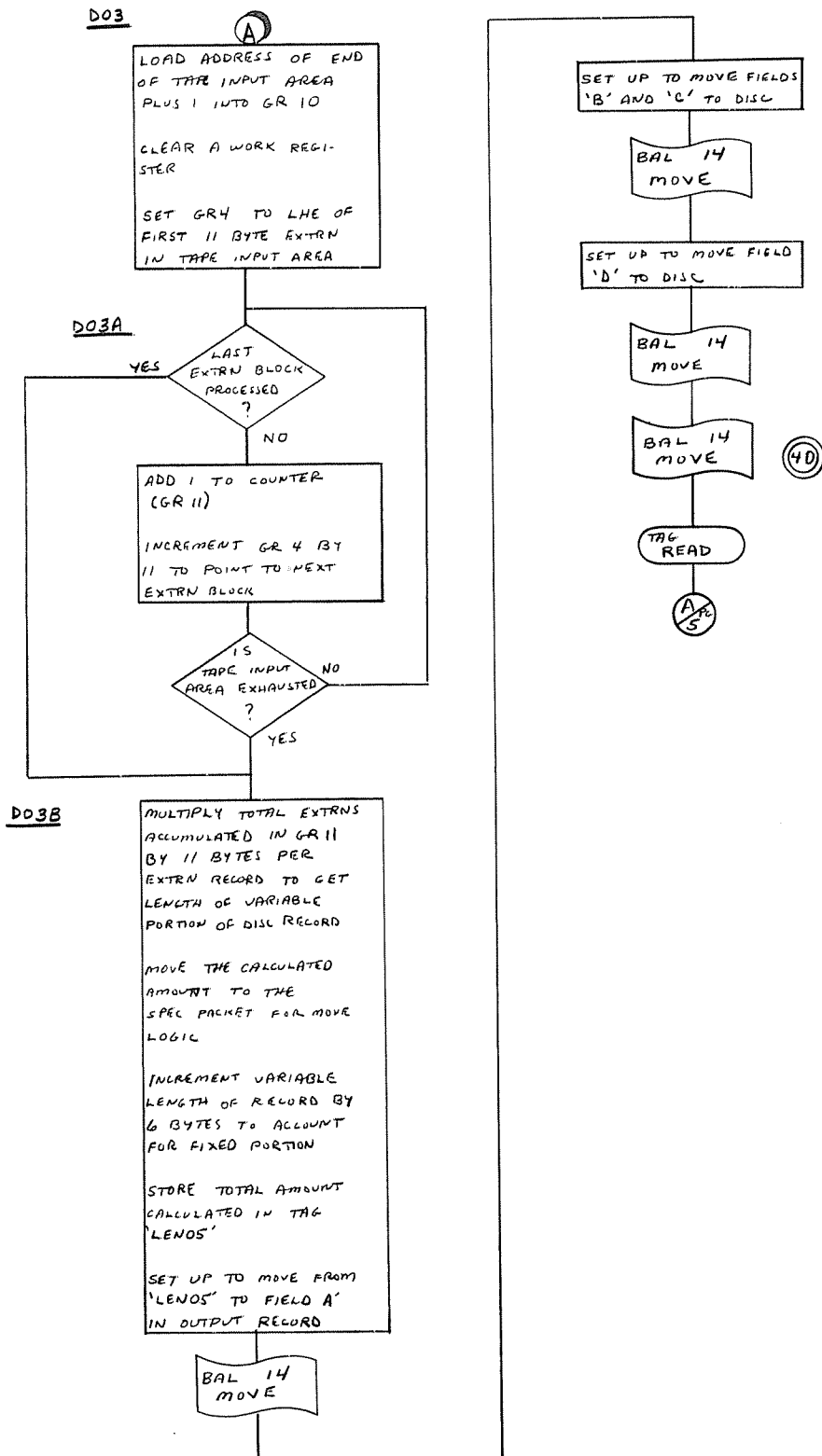
 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title INDEX BLOCK (01) Program Title 	Date 	Chart No. 9 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title 	Letter 	Revision Date





RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title INDEX BLOCK (01) PROCESSING	Date	Chart No. 10 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title	Letter	Revision Date

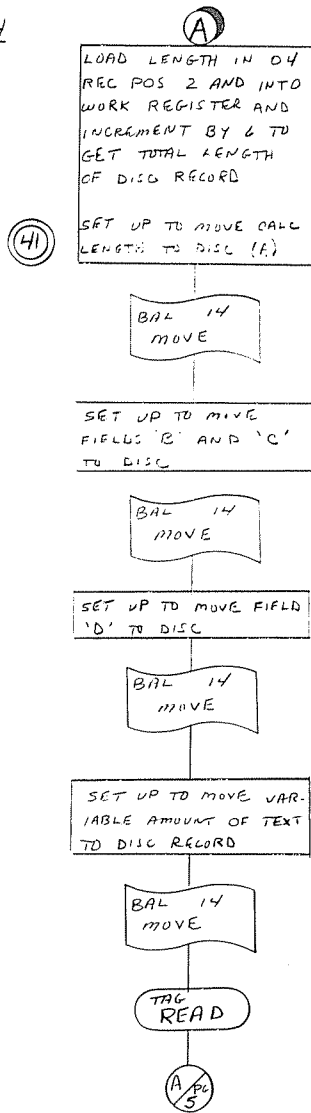


	RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING		Chart Title OBJECT MODULE DESCRIPTOR BLOCK (02) PROCESSING	Date	Chart No. 11 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)			Program Title		Revision Letter Date

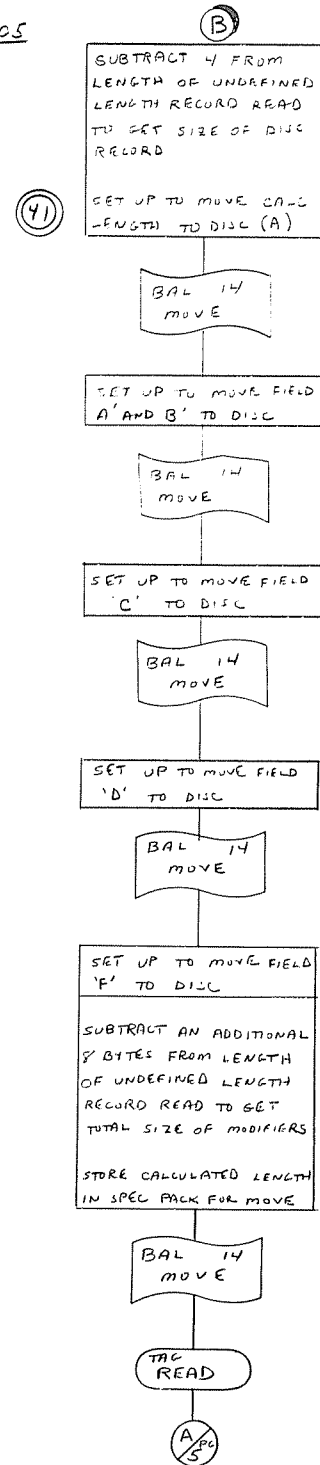




 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	 Chart Title EXTRN BLOCK (03) PROCESSING	Date	Chart No. 12 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title	Revision Letter	Date

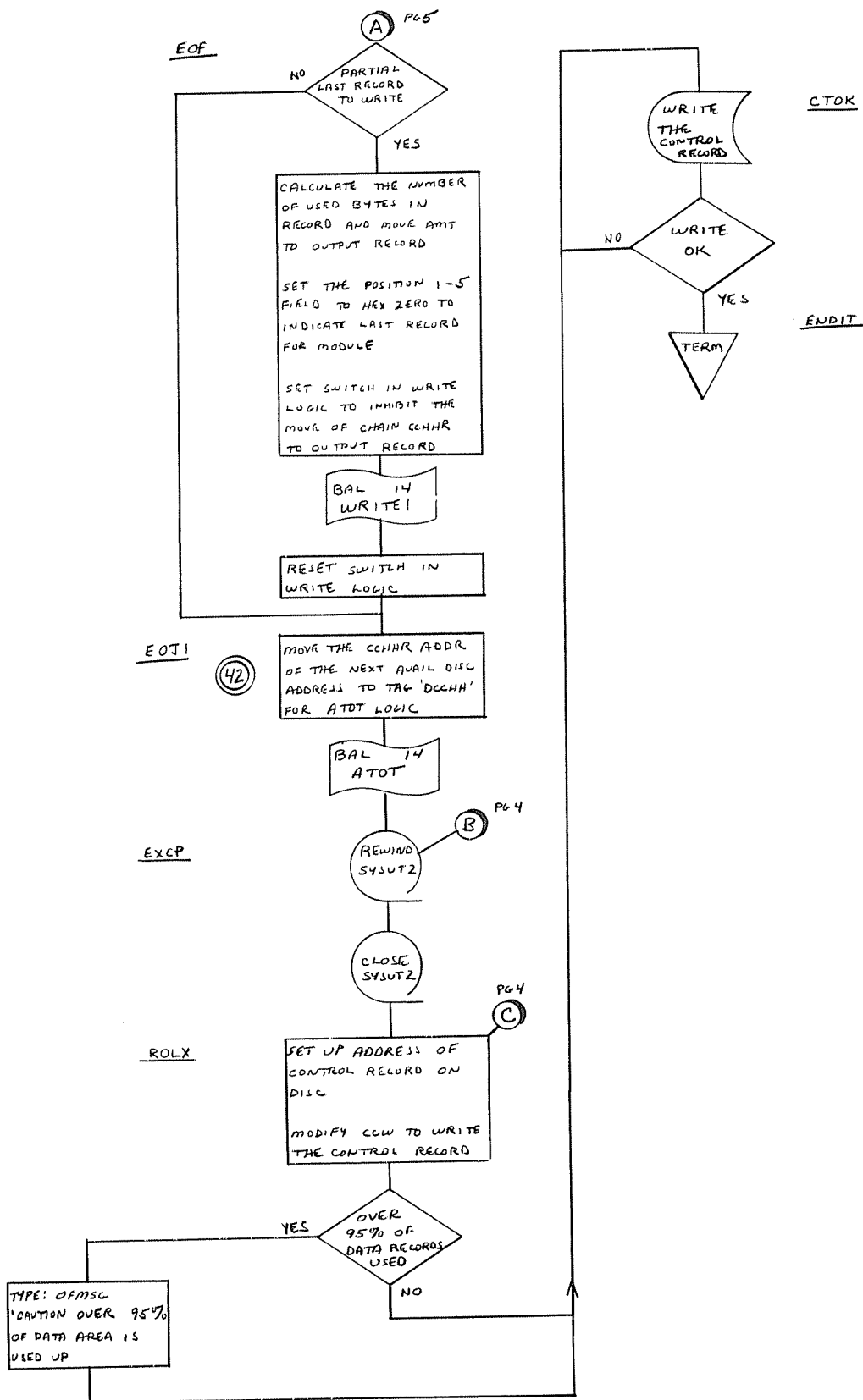
D04





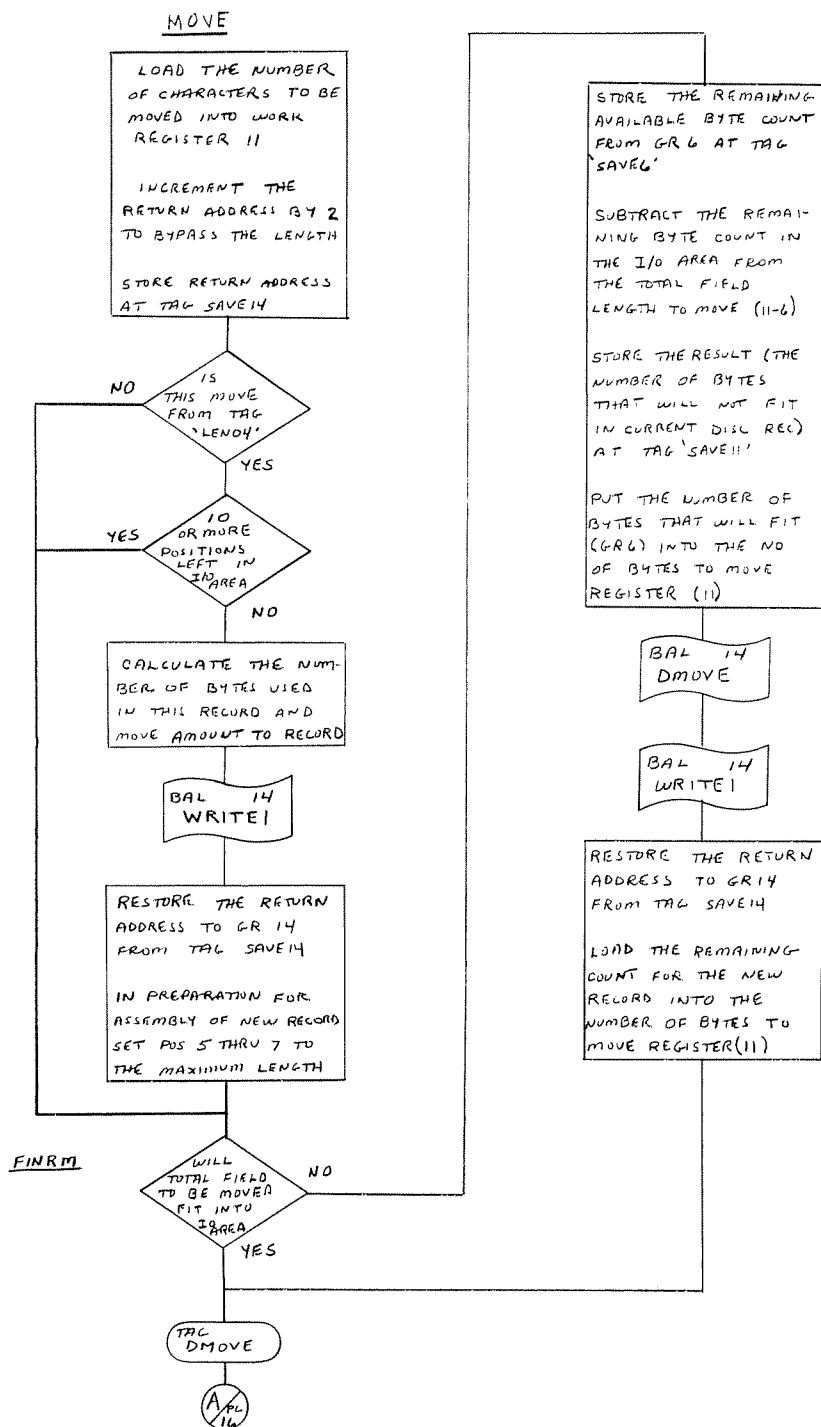
D05



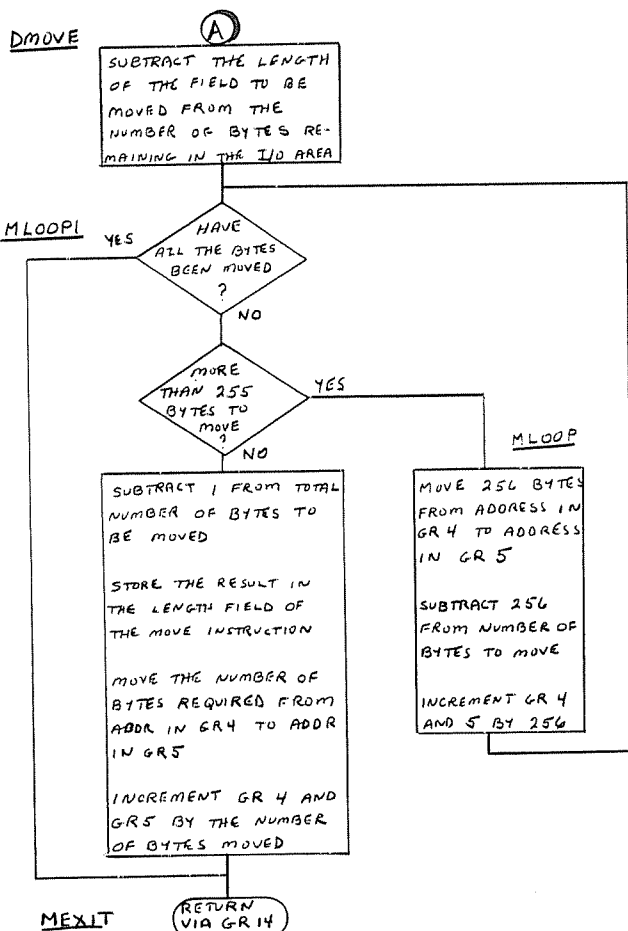
 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	 Chart Title TEXT BLOCK (04) PROCESSING MODIFIER BLOCK (05) PROCESSING	Date	Chart No. 13 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DUMLMR)	Program Title	Letter	Revision Date



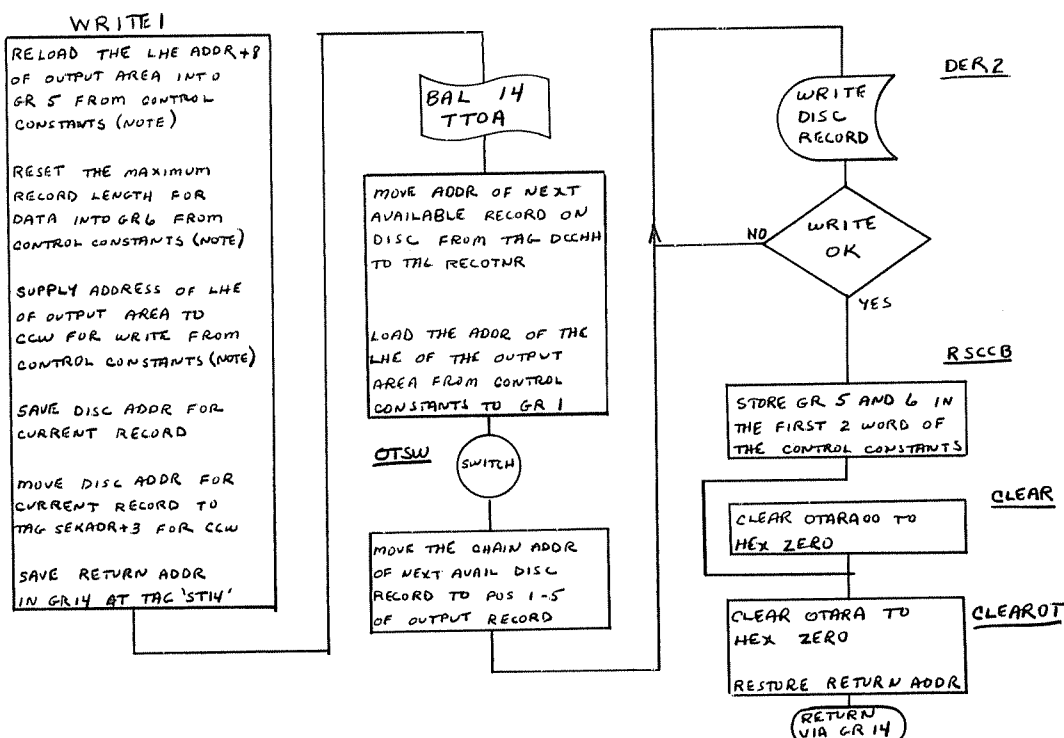
 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	 Chart Title END OF JOB LOGIC	Date	Chart No. 14 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title	Letter	Revision Date





System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Chart Title MOVE LOGIC WILL RECORD TO BE MOVED FIT IN I/O Program Title SUB ROUTINE 'MOVE'	Date	Chart No. 15 of 24
		Letter	Revision Date

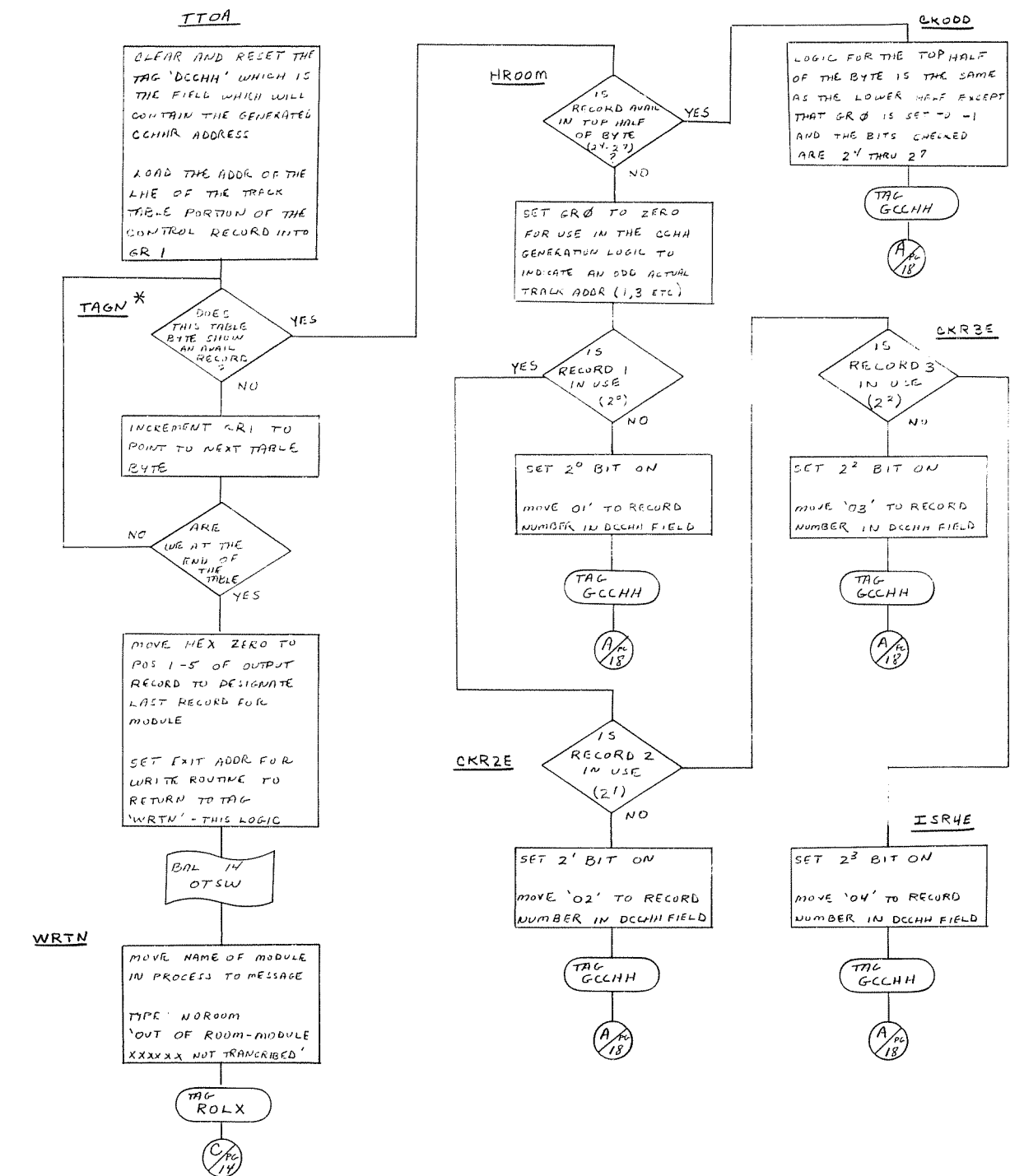


NOTE: CONTROL CONSTANTS ARE THE SERIES OF FIELDS POINTED TO BY GR 7. THEY WILL BE AT TAG RECORD FOR THE 00 RECORDS, RECORD FOR THE 01 RECORDS OR RECORD FOR RECORDS 02 THRU 05




 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING		Chart Title <u>MOVE LOGIC</u> <u>MOVE LOGIC FROM INPUT TO OUTPUT</u> <u>AND WRITE LOGIC</u>		Date	Chart No.
		System Title <u>DISC OBJECT MODULE LIBRARY</u> <u>MAINTENANCE ROUTINE (DOMLMR)</u>		Program Title	Letter

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* FOR THE 70/590 THE BYTE IN THE TABLE IS CHECKED FOR HEX 'FF' TO DETERMINE IF ALL RECORDS IN THE TWO TRACKS REPRESENTED ARE USED. FOR THE 70/604 THE BYTE IS CHECKED FOR HEX '77'

 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title TABLE TO ADDRESS LOGIC (TTOA)	Date	Chart No. 17 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title DETERMINE RECORD NUMBER	Revision Letter	Date

GCCHH

(A)

SUBTRACT THE LHE
ADDRESS OF THE TRACK
TABLE FROM THE ADDR
OF THE BYTE IN THE
TABLE REFLECTING
ROOM

INCREMENT THE DIFF
BY 1

DOUBLE THE RESULT

THE RESULT IS DE-
CREASED BY 1 IF
THE AVAIL RECORD WAS
FOUND IN BITS 2⁰ THRU
2³ OTHERWISE IT IS
UNCHANGED BY THE ADD-
ITION OF ZERO. THIS
DETERMINES WHICH OF
THE TWO TRACKS RE-
PRESENTED BY A BYTE
IN THE TRACK TABLE
IS TO BE USED.

THE RESULT IS DE-
CREASED BY 1

THE RESULT IS COPIED
FROM GR 1 TO GR 0
FOR USE IN TENTATIVE
DIVIDE INSTRUCTION

NO
RESULT
LARGER THEN
10 FOR 564
OR
20 FOR
590
YES

DIVIDE RESULT BY 10
TRACKS PER CYL FOR
564 OR 20 TRACKS
PER CYL FOR 590

ADD THE STARTING
CYL NUMBER OF THE
DATA PORTION OF
THE FILE (C2) TO
QUOTIENT

STORE RESULT IN THE
FIRST 2 POSITIONS OF
TAG DCCHH AS CYLINDER
NUMBER


U10

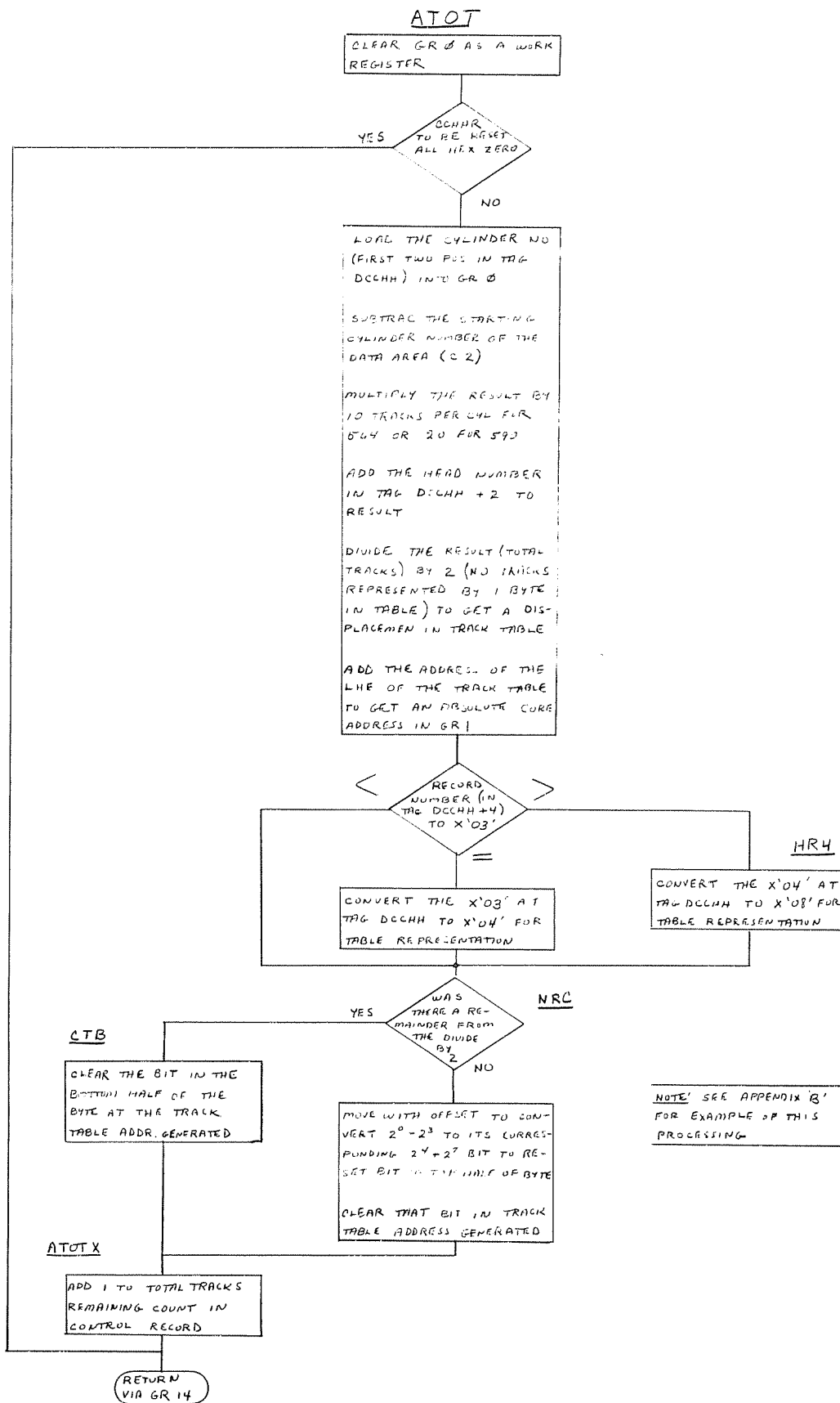
STORE THE REMAINDER
(GR0) IN TAG DCCHH
+ 2 FOR TRACK NO



SUBTRACT 1 FROM TOTAL
TRACKS REMAINING COUNT
IN CONTROL RECORD

RETURN
VIA GR14

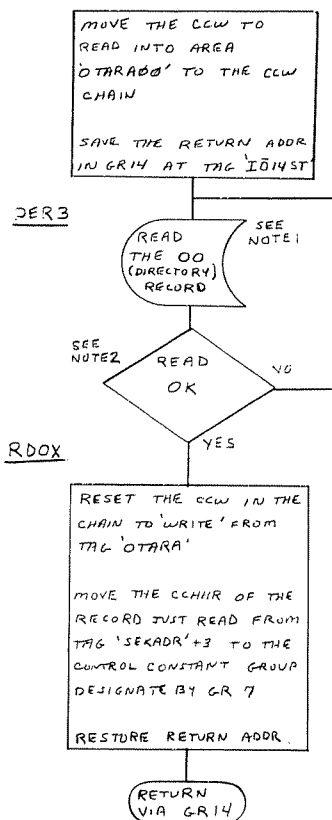
NOTE: SEE APPENDIX 'B'
FOR EXAMPLE OF ADDRESS
GENERATION FROM TABLE

<p> RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING</p> <p>System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)</p>	<p>Chart Title TABLE TO ADDRESS LOGIC (TTDA)</p> <p>Program Title CALCULATE CYLINDER AND HEAD NO.</p>	<p>Date</p> <p>Letter</p>	<p>Chart No. 18 of 24</p> <p>Revision Date</p>
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 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	 Chart Title RESET USED BIT IN TABLE BASED ON CCHH ADDRESS (ATOT)	Date	Chart No. 19 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title	Letter	Revision Date

READ0



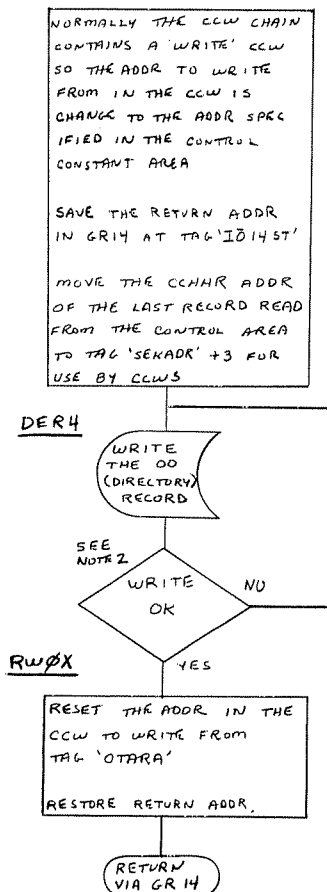
NOTE 1

THE CCHHR OF THE RECORD TO BE READ MUST RESIDE AT TAG 'SEKADR'+3 PRIOR TO BAL INTO READ0 OR READ1

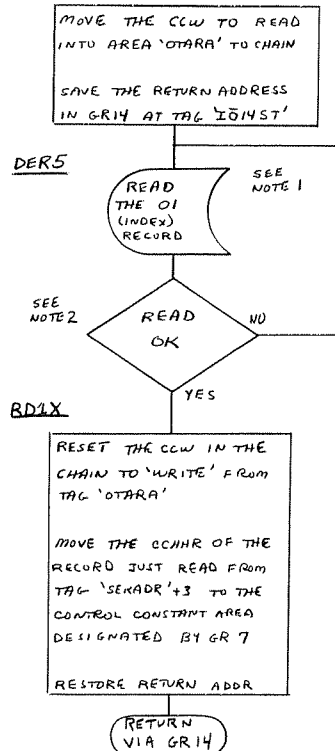
NOTE 2

A BAL 14 TO TAG 'RTRY' IN THE GETEM MACRO MAINTAINS A COUNT OF THE NUMBER OF RETRIES. AFTER TWO ATTEMPTS, A MESSAGE IS TYPED TO THE OPERATOR

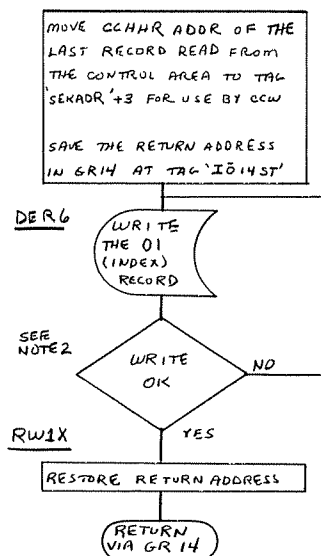
WRITE0




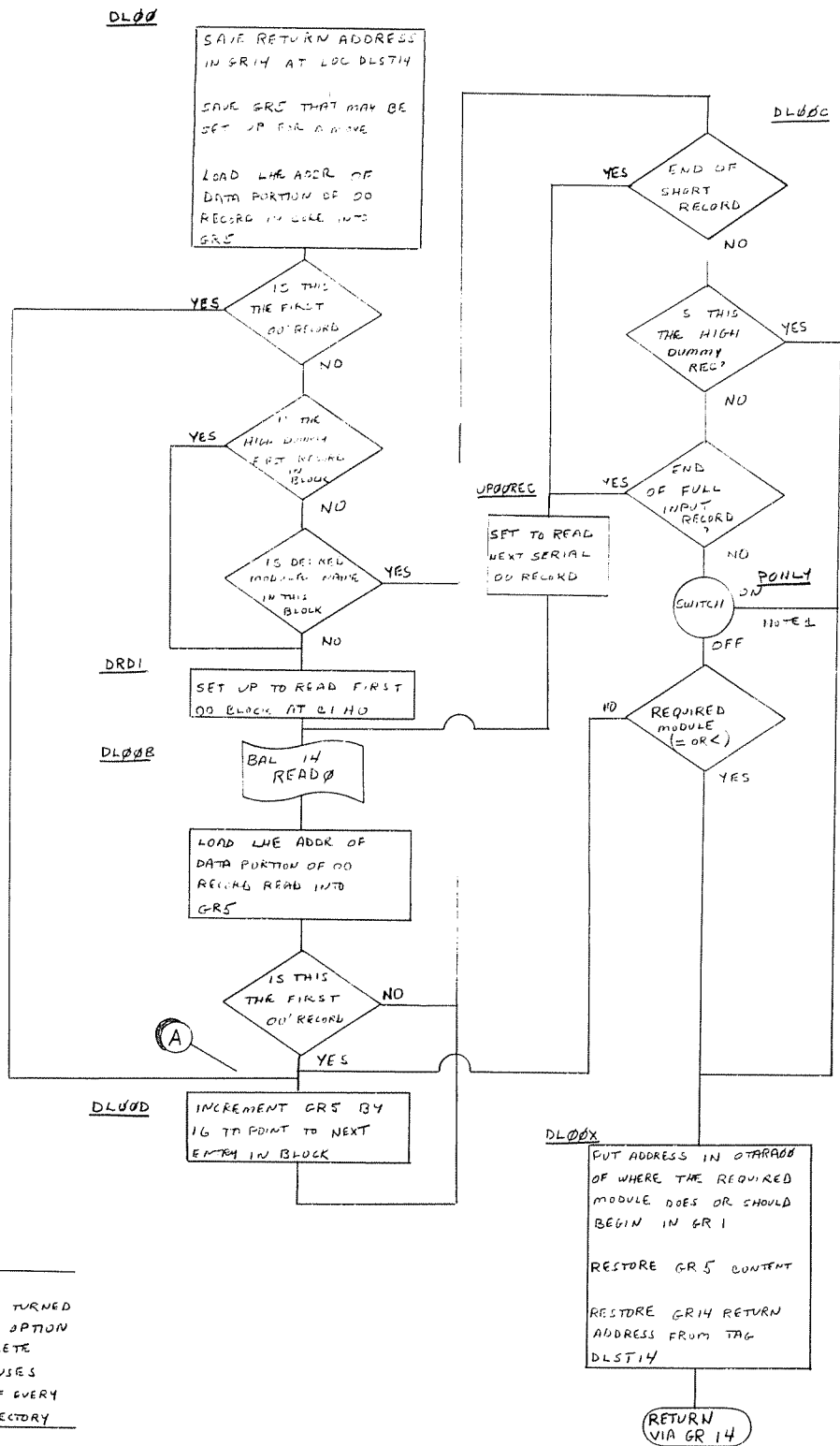
READ1




WRITE01

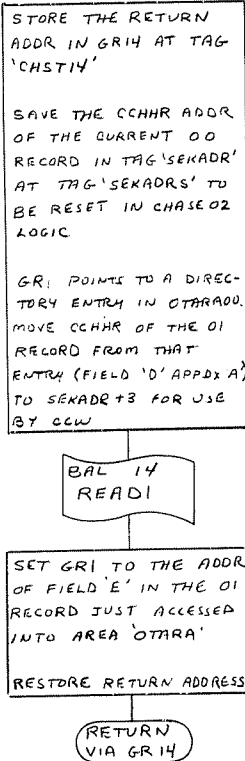


 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title READ LOGIC FOR RECORD TYPE 00 USED TO REWRITE UPDATED 00 RECORD	Date	Chart No. 20 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title READ LOGIC FOR RECORD TYPE 01 USED TO REWRITE UPDATED 01 RECORD	Letter	Revision Date

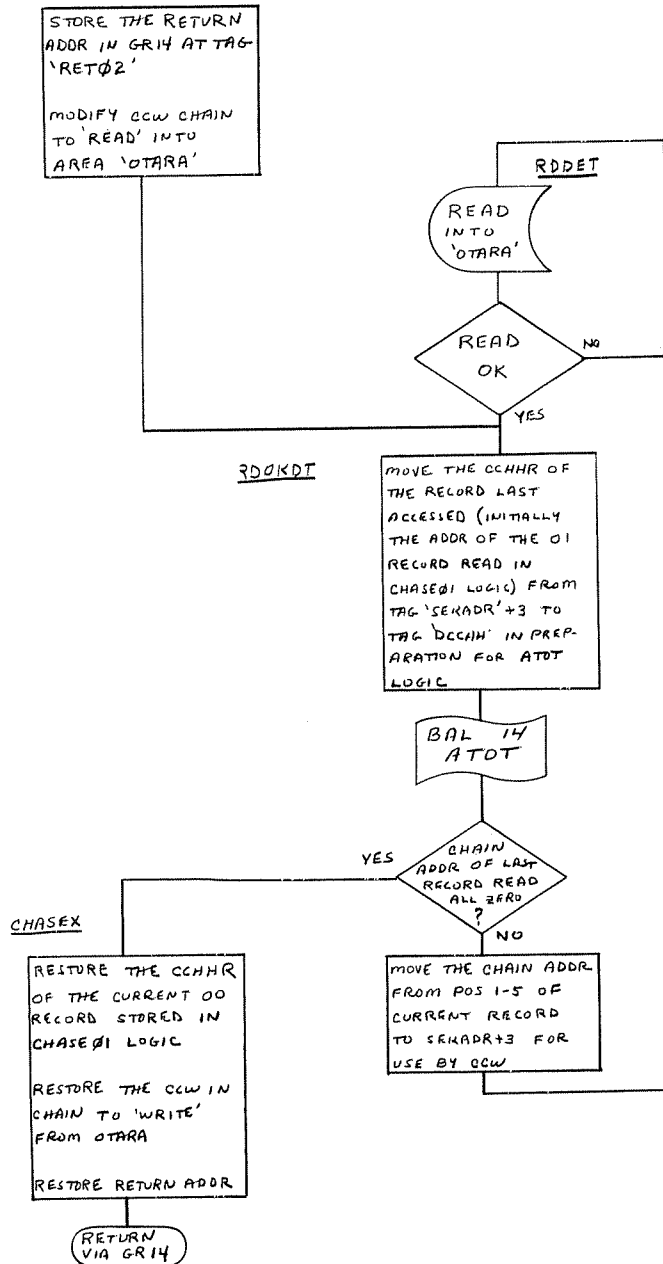



 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title LOCATE MODULE NAME IN DD RECORD	Date	Chart No. 21 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title SUB MODULE	Revision Letter	Date

CHASE01



CHASE02



 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title LOCATE 01 RECORD BASED ON 00 POINTER CHASE DATA RECORDS FROM 01 TRANSACTION	Date	Chart No. 22 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title	Revision Letter	Date

SHIFT 00

STORE THE RETURN ADDR
IN GR14 AT TAG 'DEST14'

GR5 CONTAINS THE LHE
ADDR OF THE DIRECTORY
RECORD TO BE DELETED.
COPY THIS ADDR INTO
GR4 (GR5 IS THE
'TO' ADDR FOR MOVE
LOGIC)

INCREMENT GR4 BY 16
TO POINT TO LHE OF
NEXT DIRECTORY ENTRY
(GR4 IS THE 'FROM'
ADDR FOR MOVE LOGIC)

LOAD THE LHE ADDR
OF THE DATA PORTION
OF THE 00 RECORD
(OTARADD+5) INTO
GR1

ADD THE TOTAL NUMB-
ER OF USED DATA
BYTES IN THE RECORD

SUBTRACT THE ADDR
OF THE LHE OF THE
FIELD TO BE MOVED
FROM THE RHE OF
THE FIELD TO BE
MOVED (GR1) TO GET
THE NUMBER OF BYTES
TO MOVE

SET GR6 TO 2000 TO
INHIBIT THE MOVE
LOGIC FROM WRITING
A RECORD

STORE THE CALCULATED
MOVE LENGTH IN THE
SPEL PACKET FOR THE
'MOVE' LOGIC

BAL 14
MOVE


ADJUST THE RECORD
LENGTH DOWN BY 16
FOR REMOVED ENTRY

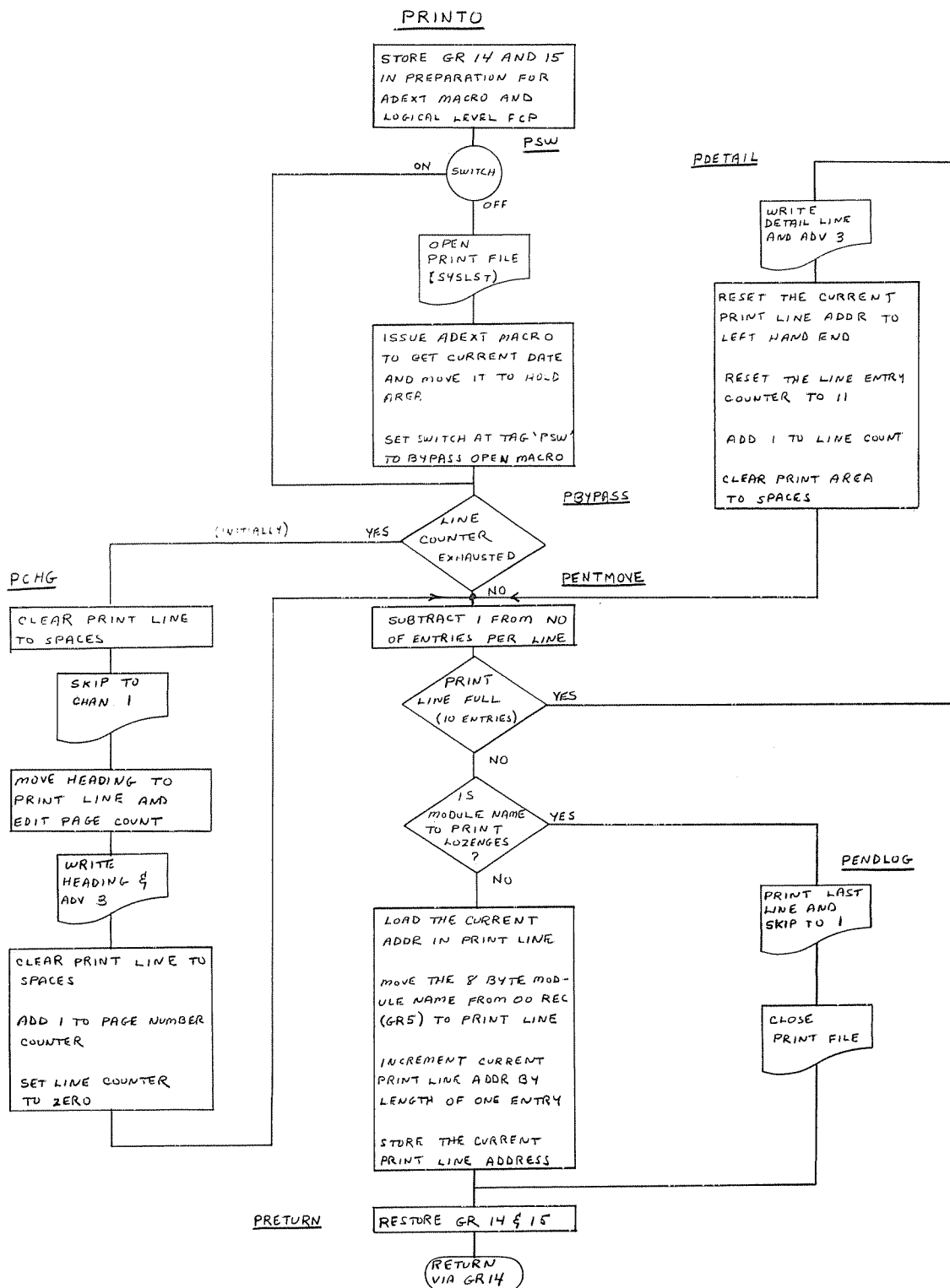
AFTER THE MOVE, GR
5 WILL BE POINTING
TO THE LHE OF THE
LAST ENTRY IN THE
DIRECTORY BLOCK.
BECAUSE THE BLOCK WAS
SHIFTED LEFT 16 BYTES,
THIS ENTRY WILL HAVE
BEEN DUPLICATED.
CHANGE THE LAST ENTRY
TO HEX ZERO TO
ERASE IT


BAL 14
WRITE 0

RESTORE RETURN ADDR

RETURN
VIA GR14

 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title SHIFT 00 RECORD TO DELETE ENTRY	Date	Chart No. 23 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DOMLMR)	Program Title	Letter	Revision Date



 RADIO CORPORATION OF AMERICA ELECTRONIC DATA PROCESSING	Chart Title MODULE NAME PRINT ROUTINE	Date	Chart No. 24 of 24
System Title DISC OBJECT MODULE LIBRARY MAINTENANCE ROUTINE (DUMLMR)	Program Title	Letter	Revision Date